FAA200NA

Nikon F-501

ニコン F-501

REPAIR MANUAL

修 理 指 針

NIPPON KOGAKU K.K.

Tokyo, Japan

1986

SPECIFICATIONS & MECHANISM

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[1] SPECIFICATIONS

Nikon F-501 [N2020 for U.S.A. and Canada, Order No. is FAA20151]

1. Outline

The F-501 indicates the direction in which single-lens reflex camera will be advanced in the future.
It is provided a lot of functions well-balancedly such as multi program auto exposure mode, DX-code system, easy loading system etc.
This camera can be used with almost all lenses i.e. new AF lens, AF lens for the F3, AI-S Nikkor lens, AI Nikkor lens and E-series lens.
When a new AF lens is attached to the camera, the motor in the camera operates the focusing function of the lens. And the informations of the CPU in the lens can be transmitted to the camera via the contact of the mount.

2. Features

1) Autofocus detecting system by the phase contrast detecting

2) New AF lens can be focused by the motor in the camera.

3) The information from the CPU in the new AF lens is transmitted to the camera.

4) Old type AF lens for the F3 can be used with the F-501.

5) AF lens can focus either on Continuous Servo mode or on Single Servo mode.

6) Motor in the spool automatically advances the film. S mode(single frame shooting) or C mode(continuous shooting) is usable.

7) Film automatically advances to the first frame when shutter release button is depressed once.

8) Exposure metering system can be selected from Program mode(normal, high-speed and dual), auto mode(aperture priority) and manual mode.

9) TTL auto flash control is possible.

10) When the exposure metering mode selector is set to program mode, programmed TTL auto flash is possible.

11) Film speed can automatially be set when the DX-coded film is used. Manual setting is also possible.

12) In the condition of low light intensity, autofocus operates properly with the supporting light of the SB-20.

3. Specifications

Type of camera: Refer to the F-301.

Picture size: Refer to the F-301.

Usable film: Refer to the F-301.

Usable lens: 1) New type AF Nikkor lenses
2) AF Nikkor lenses for the F3 (The TC-16S cannot be used.)
3) AI-type Nikkor lenses (AI, AI-S, E-series lenses)

- In autofocus shooting, all the lenses of 1) and 2) can be used and the lenses of 3) whose F number is smaller than 2.8 can be used with the TC-16AS.
- In focus aid shooting, all the lenses of 1), 2) and 3) whose F number is smaller than 4.5 can be used. (Some lenses modified to AI-type can be used.)

Standard lens: New AF Nikkor 50mm F2.8S or New AF zoom Nikkor 35 - 70mm F3.3 - 4.5S lens.

Maximum aperture index: Refer to the F-301.

Shutter: Refer to the F-301.

Lens mount: Refer to the F-301.

Exposure control mode: Dual programmed mode(PDUAL) is made in addition to the modes which the F-301 has.
On PDUAL mode, normal program is used with the lens whose focal length is shorter than 135mm, and high speed program is used with the lens whose focal length is 135mm or longer.
On PDUAL mode, normal or high speed program can automatically be selected because the camera body detects the focal length signal output from the lens.

Electronic circuit: 1) M50753P·····MCU
2) M51004P·····Head amplifier
3) M51046P·····Indicator and decoder IC
4) M51049P·····AF motor driving IC
5) HSM12N·····CCD sensor module
6) HIM21·····Interface module

1) and 2) are used also in the F-301.

Autofocus detecting system: The distance from the camera to the subject is detected through the lens in the phase contrast detecting method by custom TCL. Sensor module is in the conjugate position to the film plane. Electric charge from 46 CCD in HSM is A/D-converted at interface module(HIM) and transmitted to CPU. CPU computes the data and decides the defocus amount.

Travelling of AF lens: New AF lens is focused by the AF motor in the camera via coupling of the mount.
Old type AF lens is focused by the motor in itself with the signal transmitted from the camera via AF contact on the mount.
Focusing of the AF lens operates while the power hold switch is on.

Lens for focus detection: The lens whose F number is smaller than 4.5.
∘Components of TCL is laid in two rows.
One is F2.8 detector(for the lens whose F number is 2.8 or smaller) and the othre is F4.5 detector (for the other lens).

Brightness for focus detection:
In operating F2.8 detector — Approx. EV4.0 or brighter
In operating F4.5 detector — Approx. EV5.0 or brighter

Autofocus lock: 1) When the new AF lens is attached, AFL(autofocus lock) button on the camera is used.
2) When the old type AF lens is attached, AFL button on the lens as well as on the camera can be used.
* While AFL button is pressed, servo does not function.

Focusing range: ±100μ (In operating F2.8 detector)
±150μ (In operating F4.5 detector)
The detector controls the lens travelling so that the subject will be in this range.
But once the subject is in this range, servo does not function again till the predictor defocus outside 150μ is detected.

Autofocus flash photography: In case that the user takes photographs in the low light condition, SB-20's AF illuminator makes it possible to take AF photography.

Exposure metering: Refer to the F-301.

Metering range: Refer to the F-301.

Exposure meter: Refer to the F-301.

Audible warning: Refer to the F-301.

Power source: 1) Four AA-type batteries
2) Four AAA-type batteries can be used with optional Nikon battery holder MB-4.

Power hold switch: Power hold switch is turned on when the shutter release button is depressed halfway; stays switched on for 8 sec after lifting finger from the button.

Shutter release: Refer to the F-301.

Battery consumption: When the power hold switch is on: Approx. 60mA
When AF lens is travelling: Apporx. 300mA

Battery check: In normal condition, the power hold switch remains on for apporx. 8 sec.

Film speed setting: Refer to the F-301.

Exposure compensation: Refer to the F-301.

Film loading: Refer to the F-301.

Frame counter: Refer to the F-301.

Self-timer: Refer to the F-301.

Servo system: With the new AF lens used, the output from the digital encoder in the camera is compared with the predictor defocus amount computed by CPU. With old type AF lens used, the output from the digital encoder in the lens is compared with the predictor defocus amount computed by CPU.
This stops focusing.
When the lens comes near the focusing point, duty proportion is changed and the rotating speed of the motor slows down by the pulse.
When the lens arrives at the focusing point, the motor is stopped by the short brake.

Focus mode: Three modes can be selected by the focus mode selector.

1) Continuous servo autofocus (C)
On this mode, AF lens tavels continuously follwing the movement of the subject.
When the power hold switch is turned on, the lens starts to travel. When the shutter release button is depressed to the end, the shutter can be released even if the lens has not focused.

2) Single servo autofocus
Once focused, focus is locked as long as the power hold switch is on.
Shutter release is not possible until the focusing is complete.

3) Manual focus
The user must focus manually according to the indicator in the viewfinder.
With the old type AF lens used, continuous servo autofocus functions when the A-M switch is set to 'A', and manual focus functions when the A-M switch is set to 'M'.

* With the non-AF lens used, the focus indicator LEDs functions regardless of the mode of the focus mode selector.

AF contacts: Signals are transmitted between the camera and the lens via AF contacts on the upper side of the mount. Function of the each contact is decided depending on the lens attached to the camera body(new or old type AF lens).

Contact	A	B	C	D	E	F	G
With new AF lens used	Vcc1	R/W1	CLK	SI/SO	R/W2	-	GND
With old AF lens used	Vcc2	Limiter	Focusing 1	Focusing 2	-	X'	GND

* GND of the old AF lens is used as ⊖ terminal of the motor driving circuit, and GND of the signal system is the mount.
The contacts A, B, C, D, E, F and G are arranged from the left.

Firing rate: When the film-advance mode selector is set to 'C' with the fresh batteries set at 20°C, the average firing rate from the first frame to the 24th frame is as follows;

1) On continuous servo autofocus mode: 1.7 frame/sec
   - ◦With focus lock: 2.5 frame/sec
   - ◦With exposure lock: 1.4 frame/sec
   - ◦With focus and exposure lock: 20 frame/sec
2) On sigle servo autofocus mode: Not fixed (depends on the subject status)
3) On manual focus mode: 2.5 frame/sec (with the non-AF lens)
   1.7 frame/sec (with the AF lens)

Accessory shoe: Refer to the F-301.

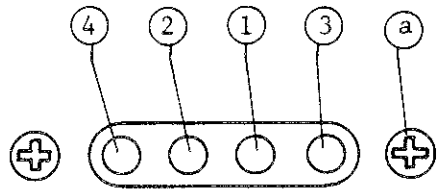
Flash synchronization: Refer to the F-301.

Auto exposure lock: Refer to the F-301.

Tipod socket: Refer to the F-301.

Sequence error warning: Refer to the F-301.

Data back contact: Four contacts are provided.



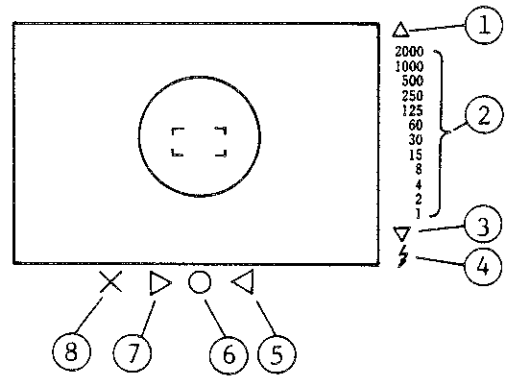
① Power hold/release signal contact
② Imprint signal contact
③ GND contact
④ Focusing signal contact

MF-19 detects the height of screw ⓐ and makes autofocus function.

Remote terminal: Refer to the F-301.

Viewfinder: 1) Focusing screen
Standard equipment: Type B(overall matte surface)
Interchangeable equipment: Type E(with a grid pattern)
Type J(with a microprism)
Each of three focusing screens has focusing brackets.

2) Quick return mirror
Half mirror
Transmission: Approx. 35%



① - ④ are same as the F-301.
⑤ - ⑧ are focusing indicator LEDs.
⑤ Focus-to-left arrow (for too near subject)
⑥ In-focus indicator
⑦ Focus-to-right arrow (for too distant subject)
⑧ Focus-not-possible warning

Film-advance LED: Refer to the F-301.

Dimensions: 148.5 x 101.5 x 54.5 (With AA-type batteries)
(W x H x D)

Weight: Approx. 625g (without batteries)

[2] MECHANISM

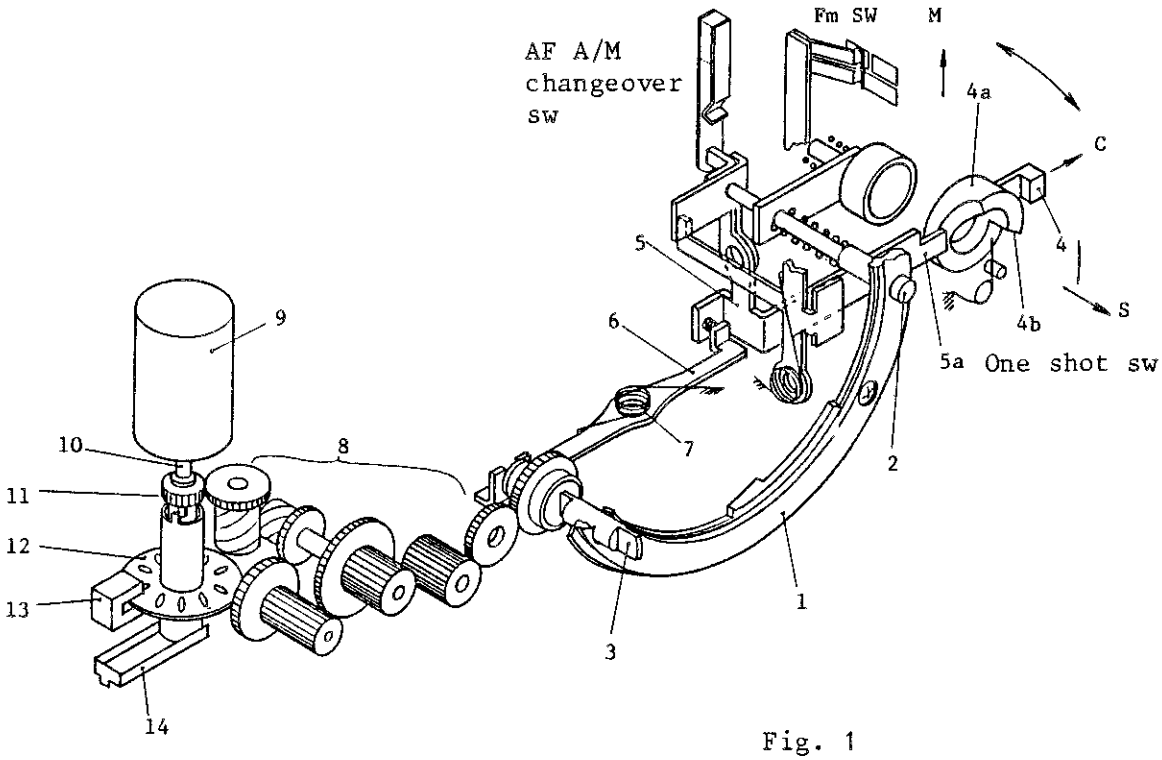


Fig. 1

Fig. 1 is a schematic diagram of autofocus control organization shown from the front side of the camera. (on continuous autofocus servo mode.)
#1 is a bayonet mount of the camera and the lens will be attached to it. position of the lens to be attached is defined by the stopper pin #2.
At the defined position, the bayonet mount of the camera is connected with the coupling for the optical operation of the lens.
#3 is a coupling shoe of the camera.
The coupling shoe #3 is combined with the motor #9 via motor gear unit #8.
The motor rotation enables the coupling to operate for focusing.

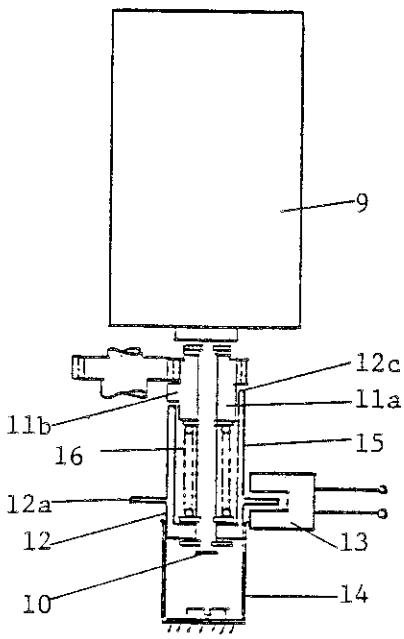


Fig. 2

Fig. 2 indicates the organization of the motor driving unit. In Fig. 2, the motor #9 is firmly fixed on the base plate. The first gear #11 of the motor gear unit is located on the motor shaft #10 which transmits the motor rotation to the gear so that the gear can rotate.
Normally, the rotation torque of the motor is transmitted to the gear via slipping mechanism which is composed of the coiled compression spring #16 and the washer #15.
The slipping mechanism is prepared so that the load should not reach the motor #9, when a big load is provided to the transmitting organization, i.e. when the optical focusing unit stops at infinity or the nearest focusing point.
When the more load than fixed is provided to the output side, the motor will slip.

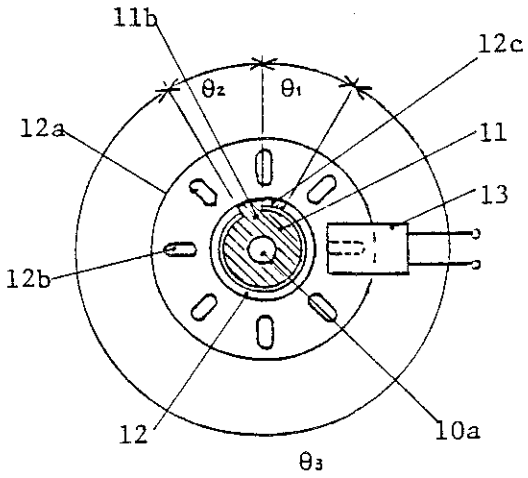


Fig. 3

#12 is relative distance signal plate and it has slits #12b in a radial shape on the plate #12a.
The encoder, which has univocal relation with the movement of the optical focusing unit, consists of this slits and the photo interrupter.
The relative distance signal plate #12 is engaged with the inner circle portion #11a of the first gear #11 and the motor shaft, and it is able to rotate by itself irrelevantly to the motor shaft or the first gear.
But the convex portion #12c on the relative distance signal plate #12 will be hanged on the convex portion #11b on the inner circle of the first gear.
So, the angle in which the relative distance signal plate can rotate irrelevantly to the backlash from the motor gear unit.
Since the relative distance signal plate #12 is supported by the plate spring #14 and given light pressure, it can rotate with the push of the convex portion but does not rotate by itself.

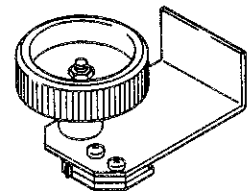
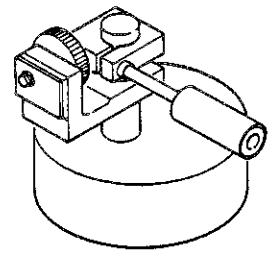
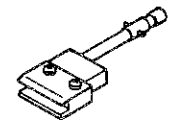
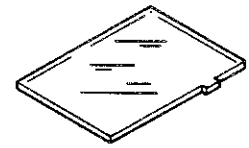
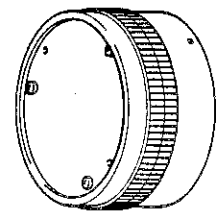
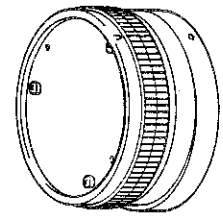
In the above-mentioned driving organization, focusing is controlled as follows. The motor is drive by the focusing condition detecting system and the calculation circuit in accordance with the data of defocus amount and its direction which is necessary for focusing.
Moving amount of the optical focusing unit by motor driving is counted with pulse number of the encoder and the optical focusing unit moves in the amount estimated initially.
After moving of the optical focusing unit, the distance from the subject is detected again. If the focusing is not available, the optical focusing unit continues to move.

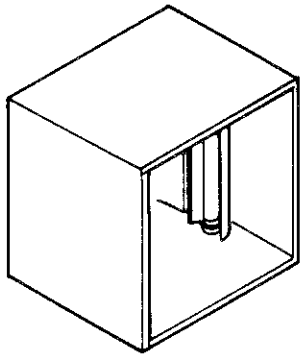
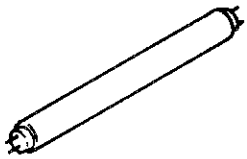
M mode
When the focus mode selector #4 is set to M, the lever #5a revolves to the left running up on the exchanging lever cam and makes the lever #6 revolve to the right.
On the other end of the focus mode selector #4, AF A/M switch is set.
When the switch is off, motor can not be driven.
At the same time, with the revolution of the lever #6, the coupling sinks from the bayonet face. So the connection of the coupling with the lens is canceled and manual focusing is possible.

C mode
When the focus mode selector #4 is set to C, the lever #5a revolves to the right.
The lever #6 revolves to the left by the spring #7 with the revolution of the lever #5a and the coupling knocks against the lens.
Aligning operation of the coupling is genarated by the pressure of the spring and the driving force is transmitted effectively.
In this case, AF A/M changeover sw is on, One shot sw is off and continuous servo autofocus is possible.

S mode
When the focus mode selector #4 is set to S as well as C, the coupling is connected with the lens. One shot sw is turned off with the convex portion on the focus mode selector and sigle servo autofocus mode is selected.

	ITEM	STANDARD	TOOL
FIRING RATE	Max. firing rate (frame per second)	With a non-AF lens: 2.5±0.5fps On C mode: 1.7±0.5fps On AF lock: 2.5±0.5fps	J9001-5 Test film (24 exposure film) Watch
CURRENT VALUE	Battery consumption	Metering and distance detection: 120mA or less AF lens driving: 400mA or less Film-advancing: 700mA or less(average)	Digital voltometer
BATTERY CHECK	Battery check voltage	5.5V or more: To hold power for 8sec 4.0V or less: To turn off LED and to lock shutter release	J9001-5 Digital voltometer

Tool No.	Name	Illustration	Class	Remarks
J15258	Manual film-advance tool		A	Common to the modified one for the F-301
J15259	AF adjuster		A	
J15260	AE LED pressure welding tool		A	Common to the modified one for the F-301
J18182	Mirror 45° inspecting tool		A	
J18184	Adapter for Yaw		A	
J18185	Adapter for pitch		A	
J18183	Lens for Z	50/1.4 S Fixed at 2m	A	
J18186	Sine chart for Z	Sine chart	A	

Tool No.	Name	Illustration	Class	Remarks
J15264	Lighting box for Z		A	For 50Hz For 60Hz
J15264-2	AAA flourescent light		A	
J15264-1	Transformer code		A	
J18191	ND filter 8x		A	

EXPLODED DRAWINGS

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6. BASE PLATE L F6
7. FRONT PLATE F7
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9. MAIN FPC F9
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11. REWIND SHAFT F11
12. TOP COVER F12
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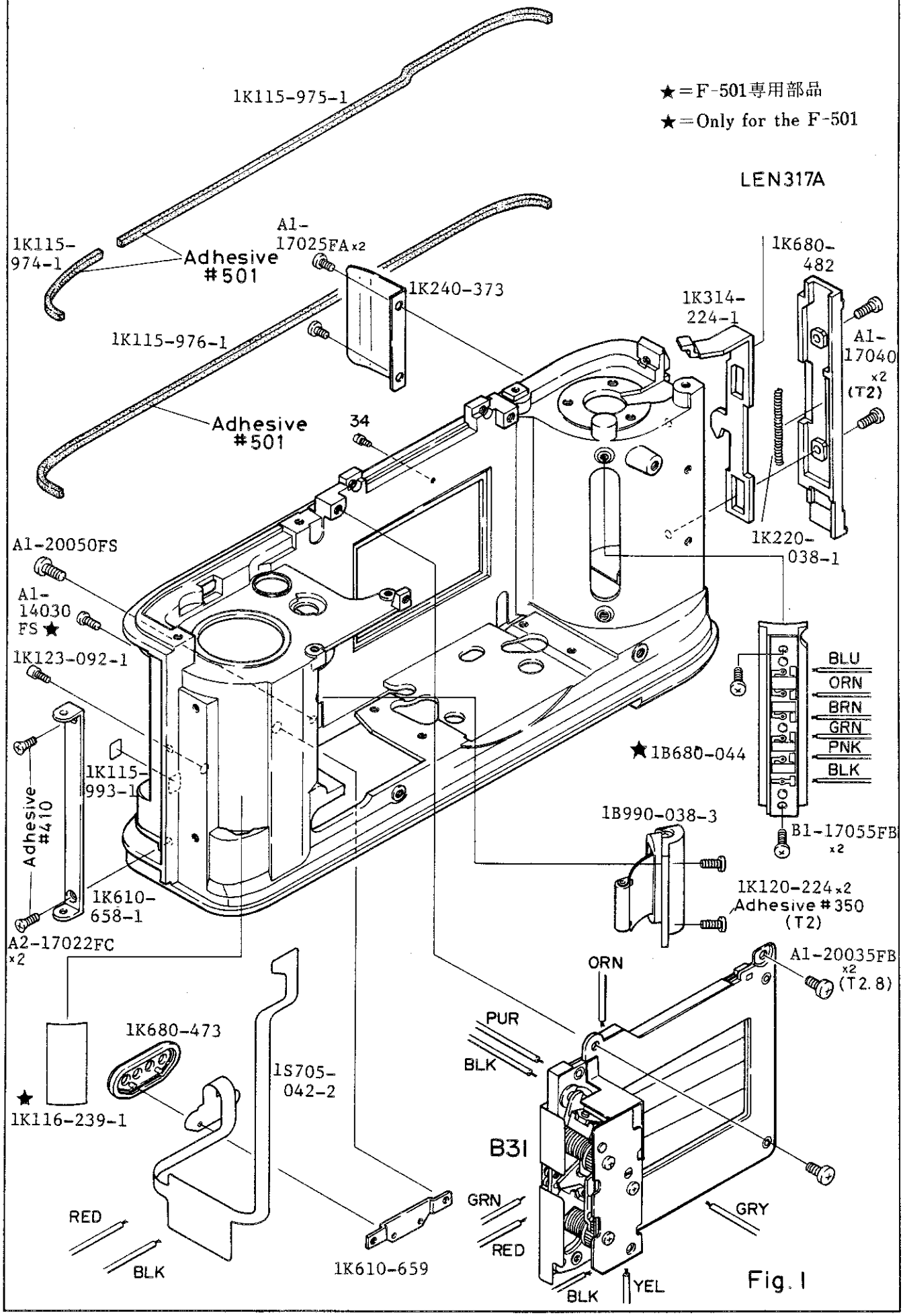
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★＝Only for the F-501
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1K240-373
1K115-976-1
Adhesive #501
34
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1K314-224-1
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A1-14030 FS★
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1K115-993-1
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Fig. 1

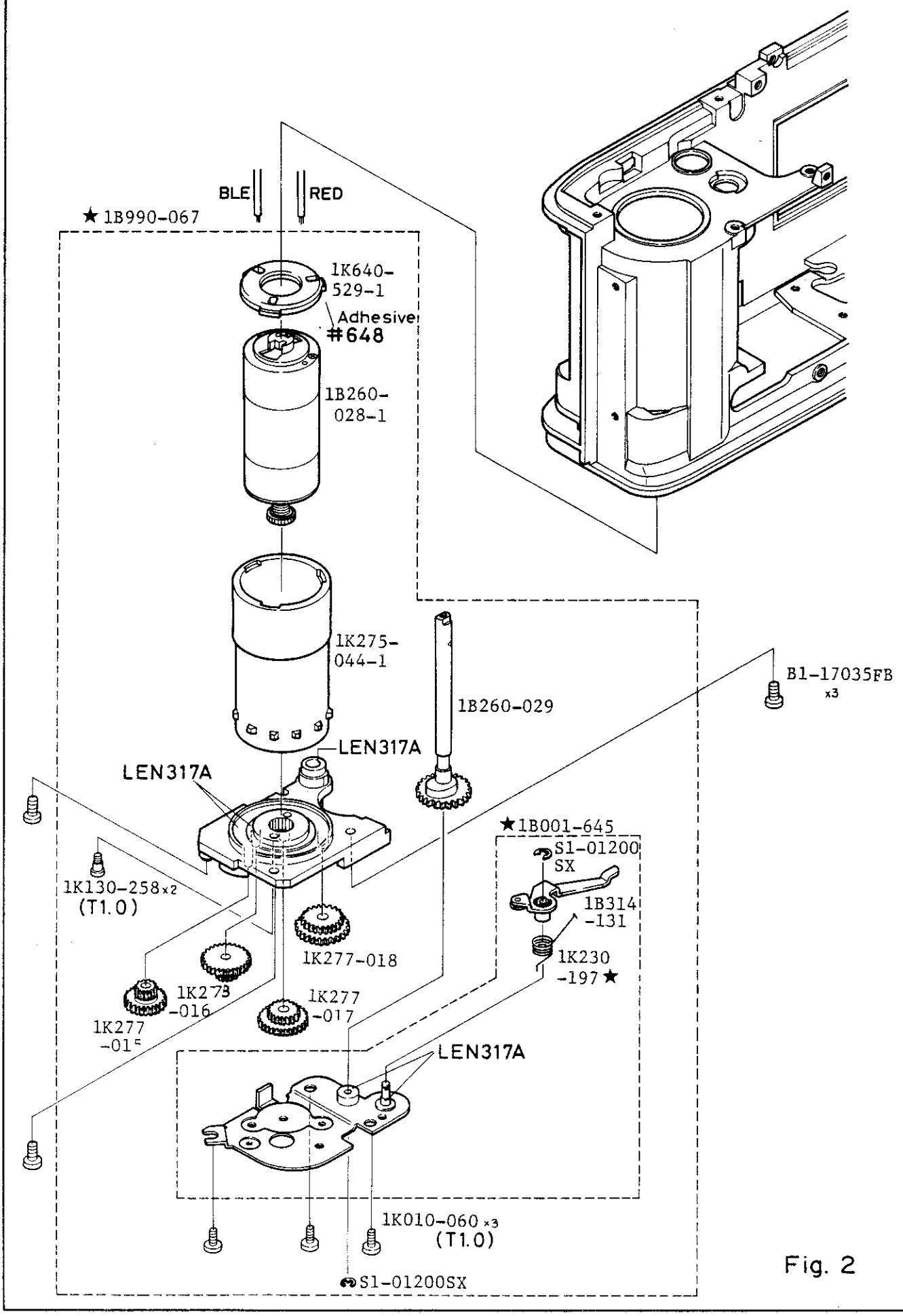
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Fig. 2

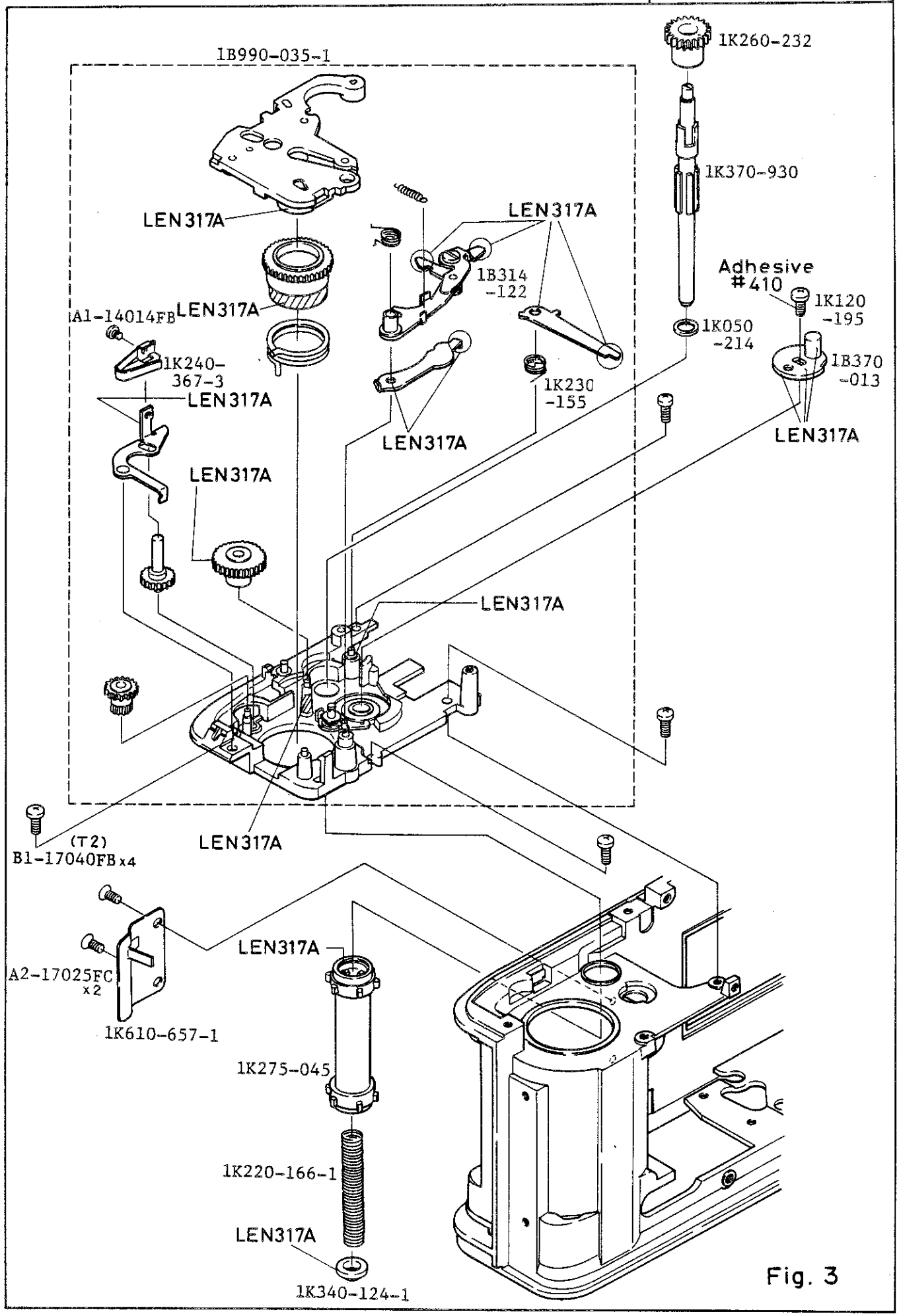
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Fig. 3

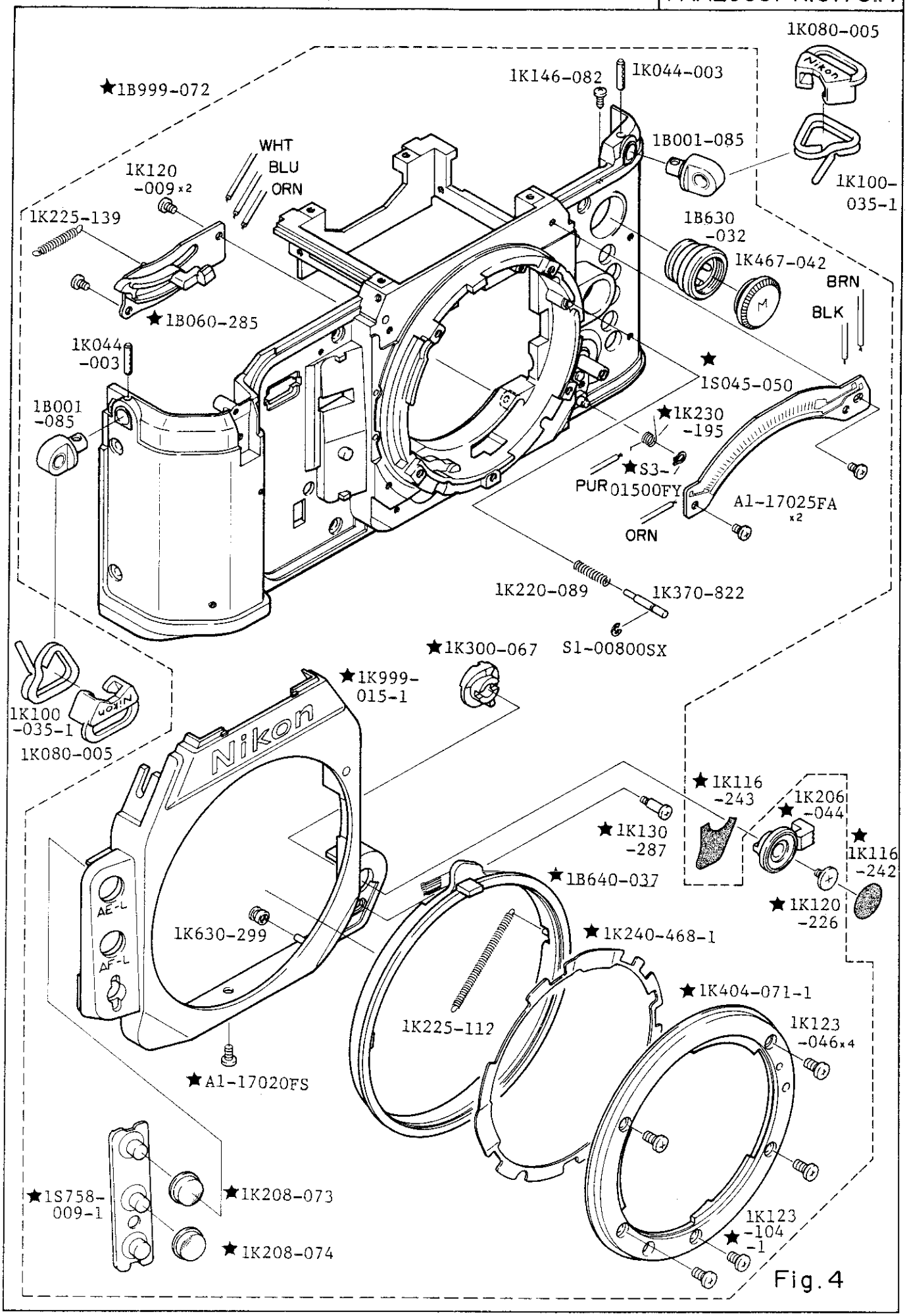
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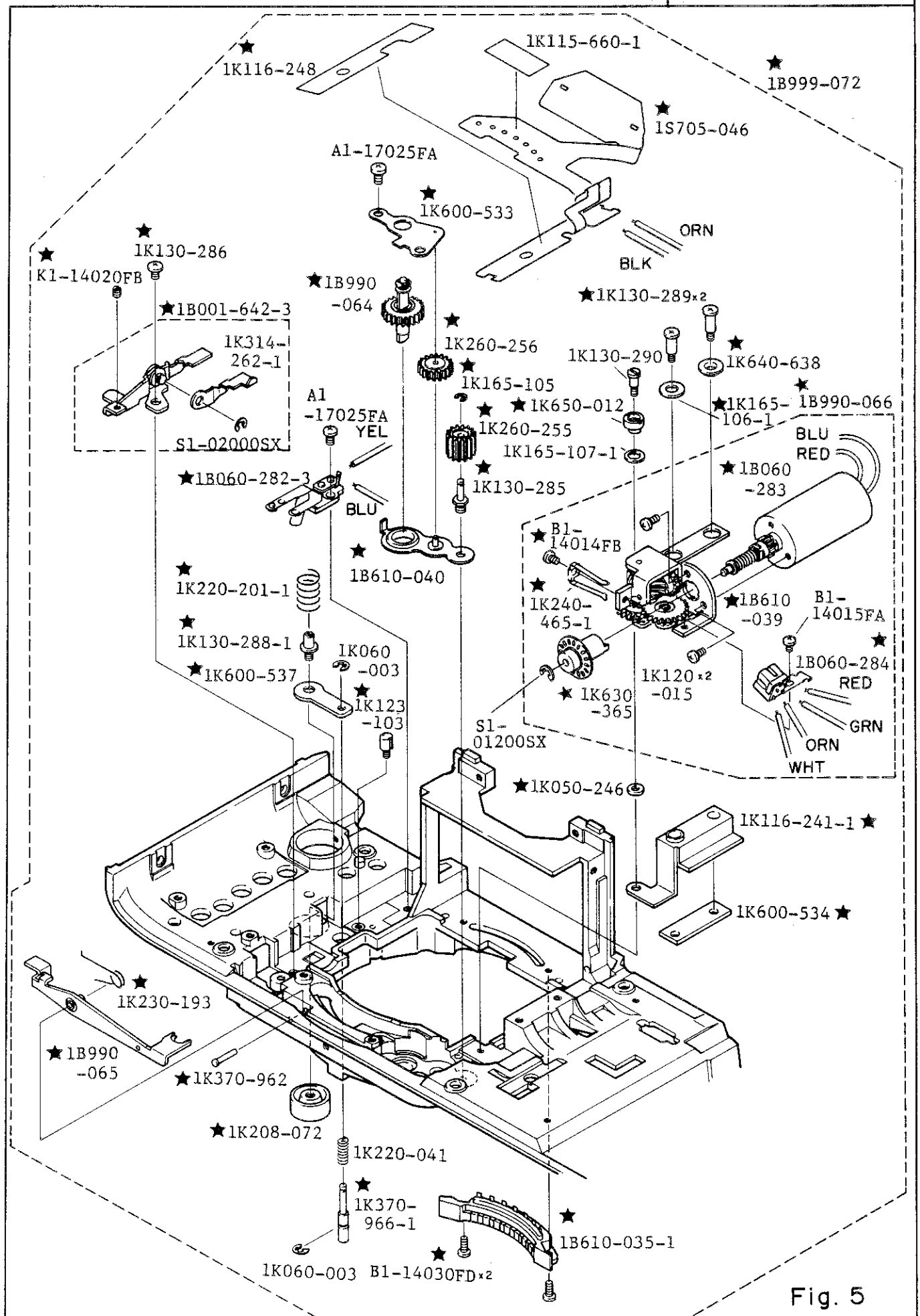
Fig.4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262-1
1K260-256
1K130-290
1K640-638
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1K260-255
1K165-107-1
BLU
RED
1B060
-283
1B060-282-3
BLU
1K130-285
S1-02000SX
B1-
14014FB
1B610-040
1K220-201-1
1K240-
465-1
1B610
-039
B1-
14015FA
1K130-288-1
1K060
-003
1K600-537
1K123
-103
1K120×2
-015
1K630
-365
1B060-284
RED
GRN
ORN
WHT
S1-
01200SX
1K050-246
1K116-241-1
1K600-534
1K230-193
1B990
-065
1K370-962
1K208-072
1K220-041
1K370-
966-1
1B610-035-1
1K060-003
B1-14030FD×2

Fig. 5

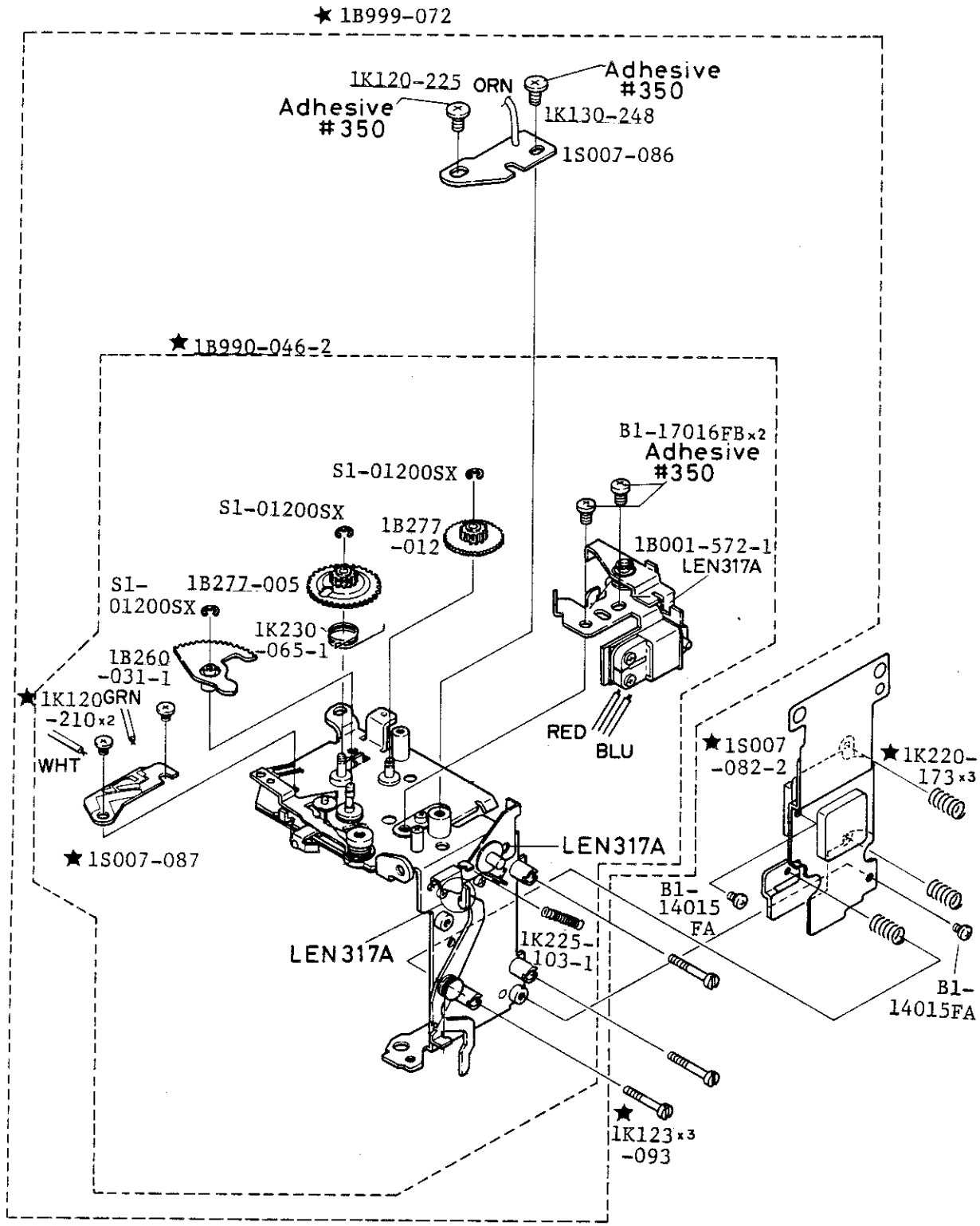

★1B999-072
1K120-225 ORN
Adhesive #350
Adhesive #350
1K130-248
1S007-086
★1B990-046-2
B1-17016FB×2
Adhesive #350
S1-01200SX
S1-01200SX
1B277-012
1B001-572-1
LEN317A
S1-01200SX
1B277-005
1K230-065-1
1B260-031-1
★1K120-210×2
GRN
WHT
RED
BLU
★1S007-082-2
★1K220-173×3
★1S007-087
LEN317A
B1-14015FA
LEN317A
1K225-103-1
B1-14015FA
★1K123×3-093

Fig. 6

DISASSEMBLING & ASSEMBLING & ADJUSTMENT & EXPLOSION DRAWINGS

Contents

[1] DISASSEMBLING

1. DISASSEMBLING OUTLINE D1
2. DISASSEMBLING PROCEDURE D2

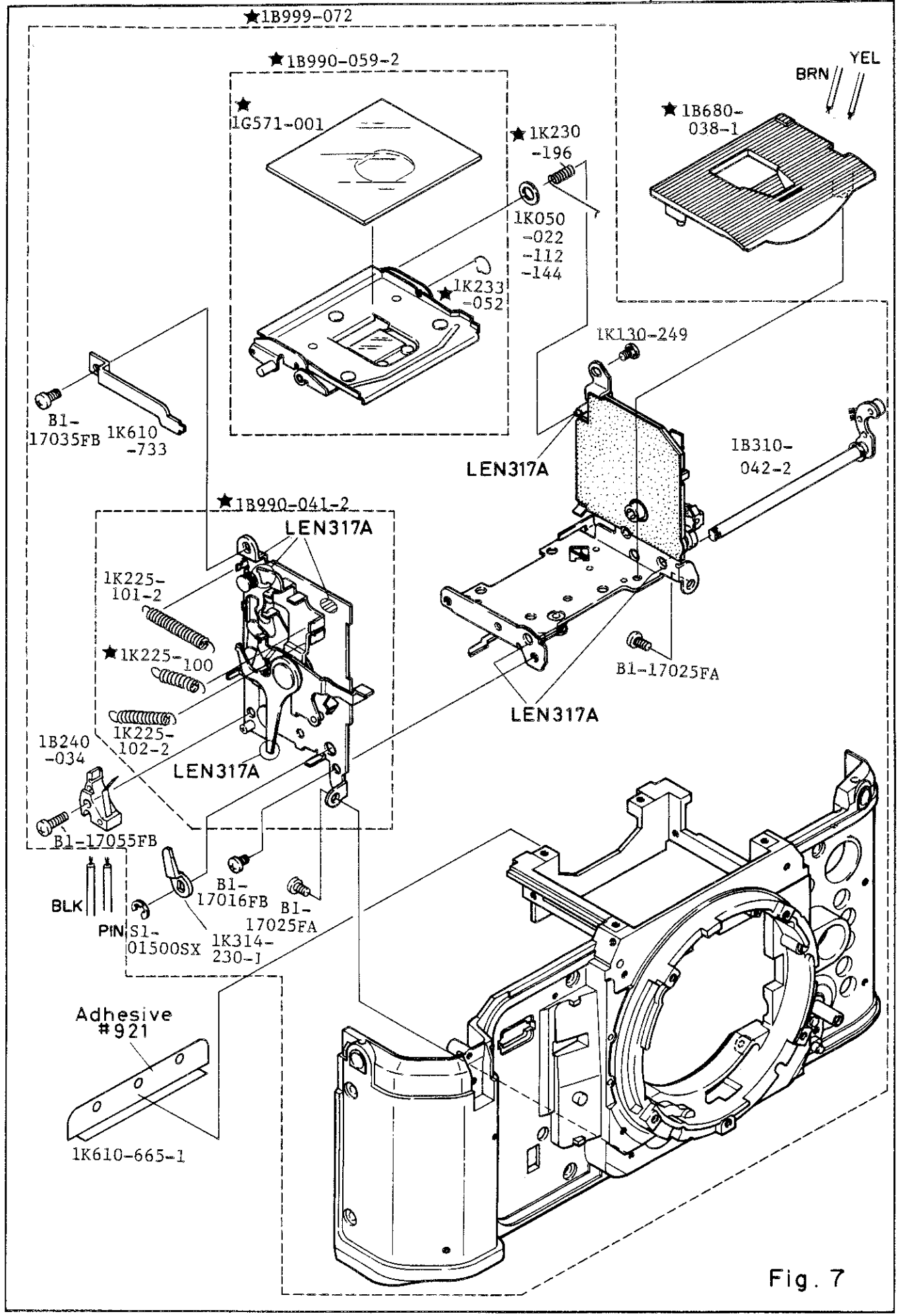
[2] ASSEMBLING & ADJUSTMENTS & EXPLOSION DRAWINGS

1. BODY-DICASTING, SHUTTER UNIT A1
2. MOTOR ROTATION REDUCING BASE PLATE A2
3. FILM-ADVANCE MECHANISM UNIT A3
4. BAYONET A5
5. FRONT PLATE(REVERSE SIDE) A7
6. BASE PLATE L A9
7. FRONT PLATE A11
8. PENTAPRISM A13
9. MAIN FPC A14
10. POWER SWITCH FPC A15
11 REWIND SHAFT A16
12. TOP COVER A17
13. BATTERY CHAMBER, BOTTOM COVER A19
14. CAMERA BACK A20
15. FRONT PLATE INSTALLATION A21
16. SHUTTER SPEED ACCURACY ADJUSTMENT A23
17. ADJUSTMENT OF AUTO FOCUS A25

Note) Please refer to the notice in the development elevation for Assembly & Adjustments in the F-301 repair manual.

7．前板部　FRONT PLATE

FAA2005I-R.3176.A



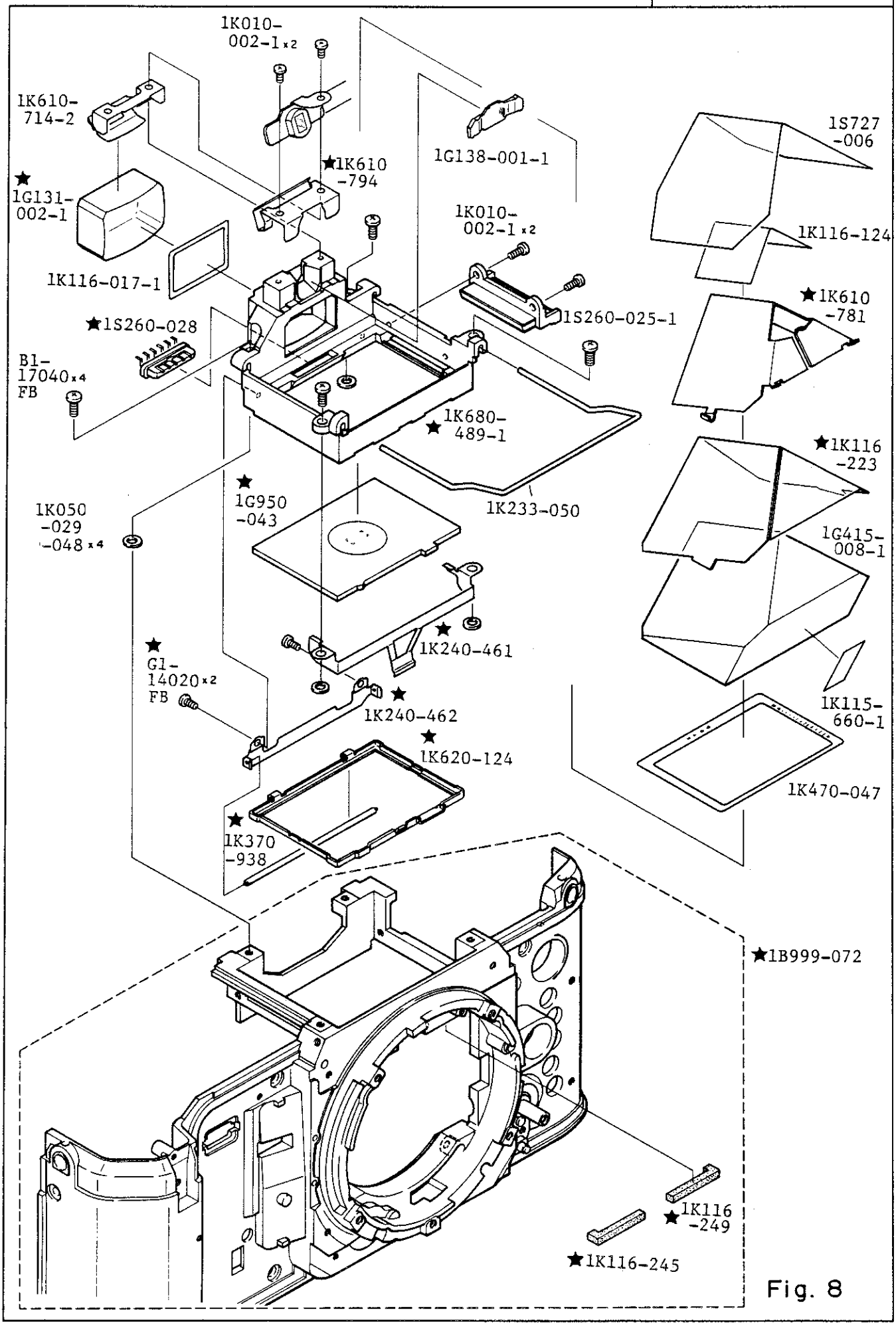

1K010-002-1×2
1K610-714-2
★1K610-794
1G138-001-1
1S727-006
★1G131-002-1
1K010-002-1×2
1K116-124
1K116-017-1
★1K610-781
★1S260-028
1S260-025-1
B1-17040×4 FB
★1K680-489-1
★1K116-223
★1G950-043
1K233-050
1K050-029-048×4
1G415-008-1
★1K240-461
G1-14020×2 FB
1K115-660-1
★1K240-462
★1K620-124
1K470-047
★1K370-938
★1B999-072
★1K116-249
★1K116-245

Fig. 8

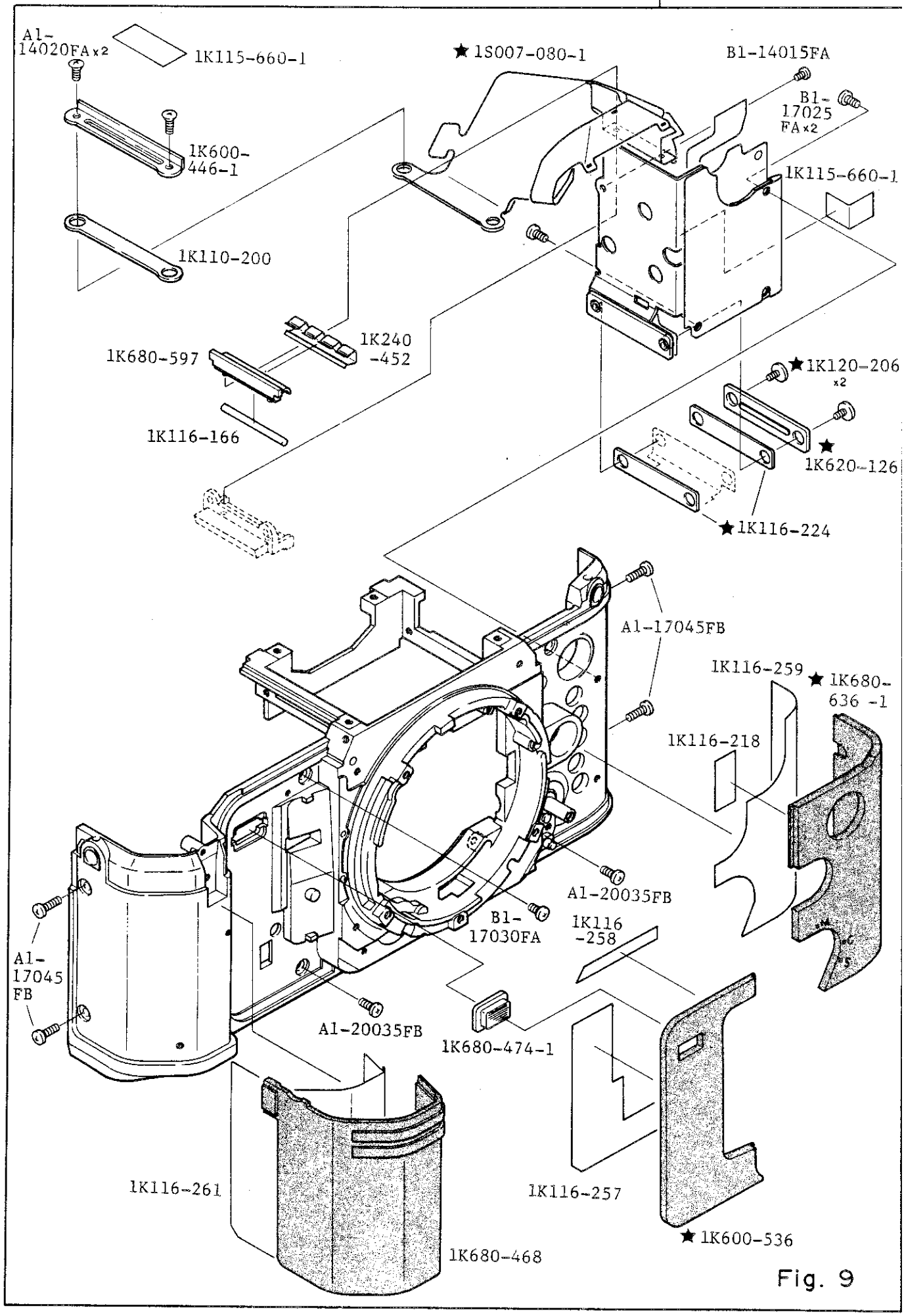
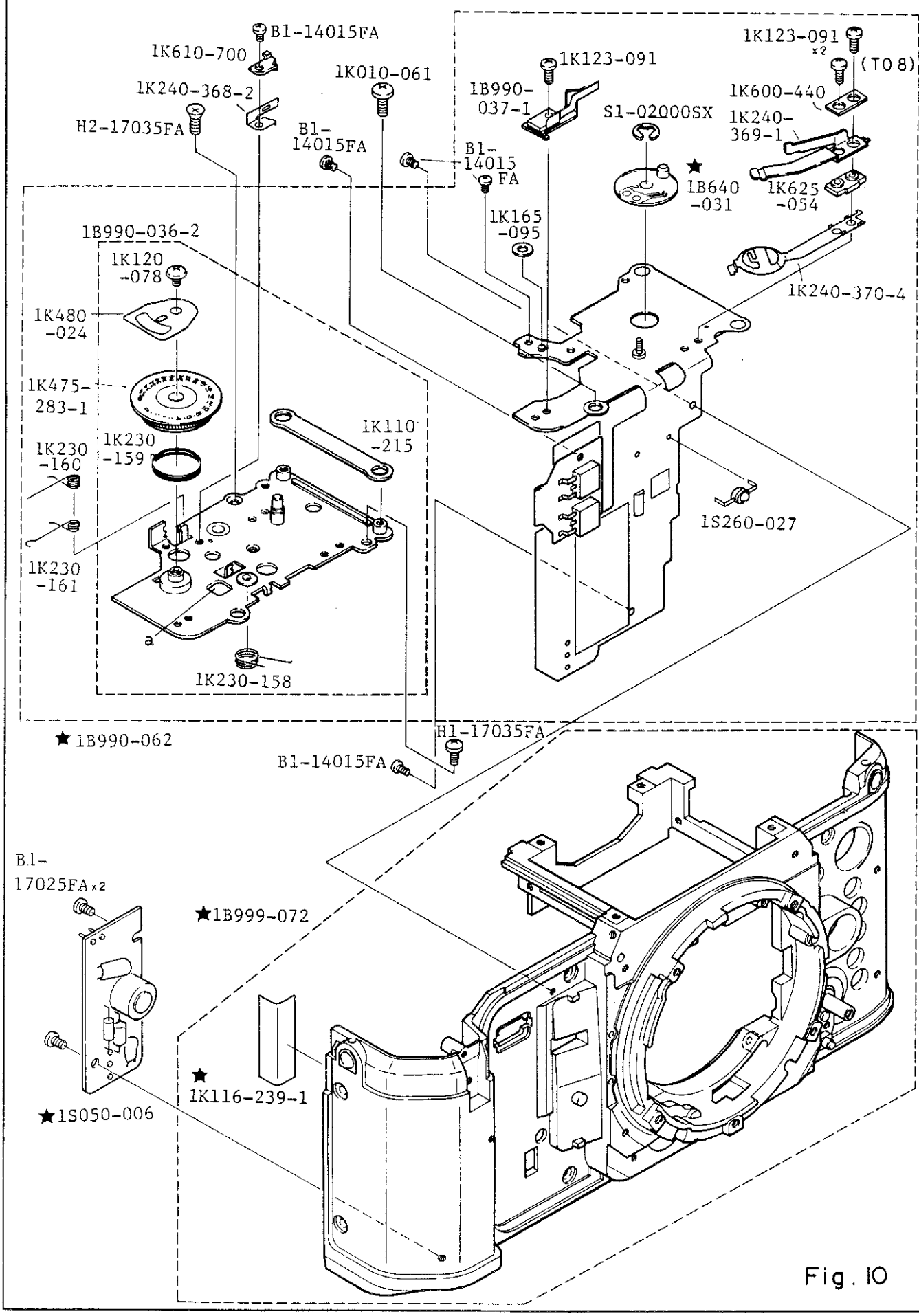

A1-14020FA×2
1K115-660-1
★1S007-080-1
B1-14015FA
B1-17025FA×2
1K600-446-1
1K115-660-1
1K110-200
1K240-452
1K680-597
★1K120-206 ×2
1K116-166
★1K620-126
★1K116-224
A1-17045FB
1K116-259
★1K680-636-1
1K116-218
A1-20035FB
B1-17030FA
1K116-258
A1-17045FB
A1-20035FB
1K680-474-1
1K116-261
1K116-257
★1K600-536
1K680-468

Fig. 9


B1-14015FA
1K610-700
1K240-368-2
H2-17035FA
1K010-061
B1-14015FA
B1-14015FA
1K123-091
1B990-037-1
1K123-091 ×2
(T0.8)
1K600-440
S1-02000SX
1K240-369-1
★1B640-031
1K625-054
1K165-095
1K240-370-4
1B990-036-2
1K120-078
1K480-024
1K475-283-1
1K230-159
1K230-160
1K230-161
1K110-215
1S260-027
a
1K230-158
★1B990-062
H1-17035FA
B1-14015FA
B1-17025FA ×2
★1B999-072
★1K116-239-1
★1S050-006
Fig. 10

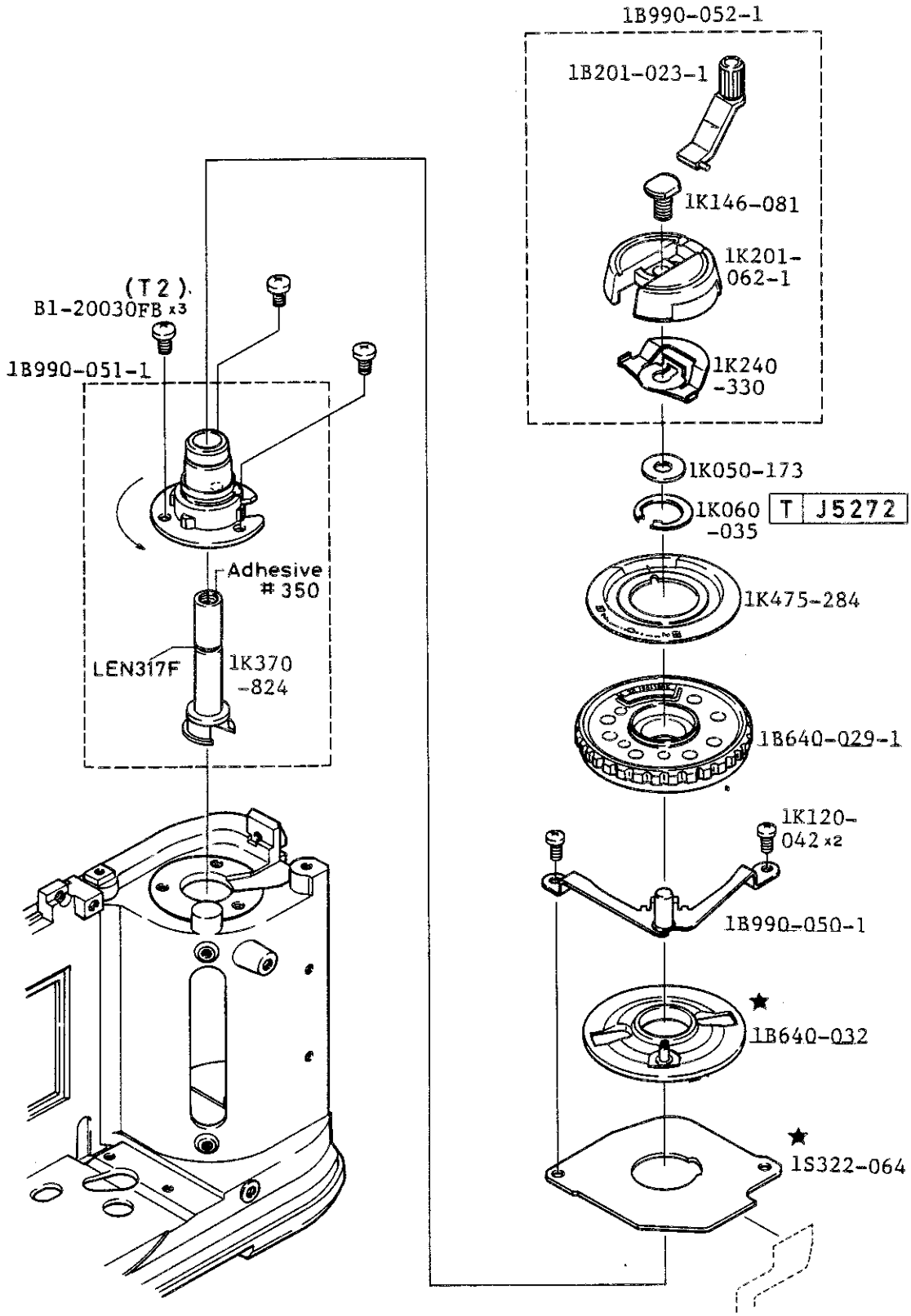

1B990-052-1
1B201-023-1
1K146-081
1K201-062-1
1K240-330
1K050-173
1K060-035
T J5272
1K475-284
1B640-029-1
1K120-042 x2
1B990-050-1
1B640-032
1S322-064
(T2)
B1-20030FB x3
1B990-051-1
Adhesive #350
LEN317F
1K370-824

Fig. 11

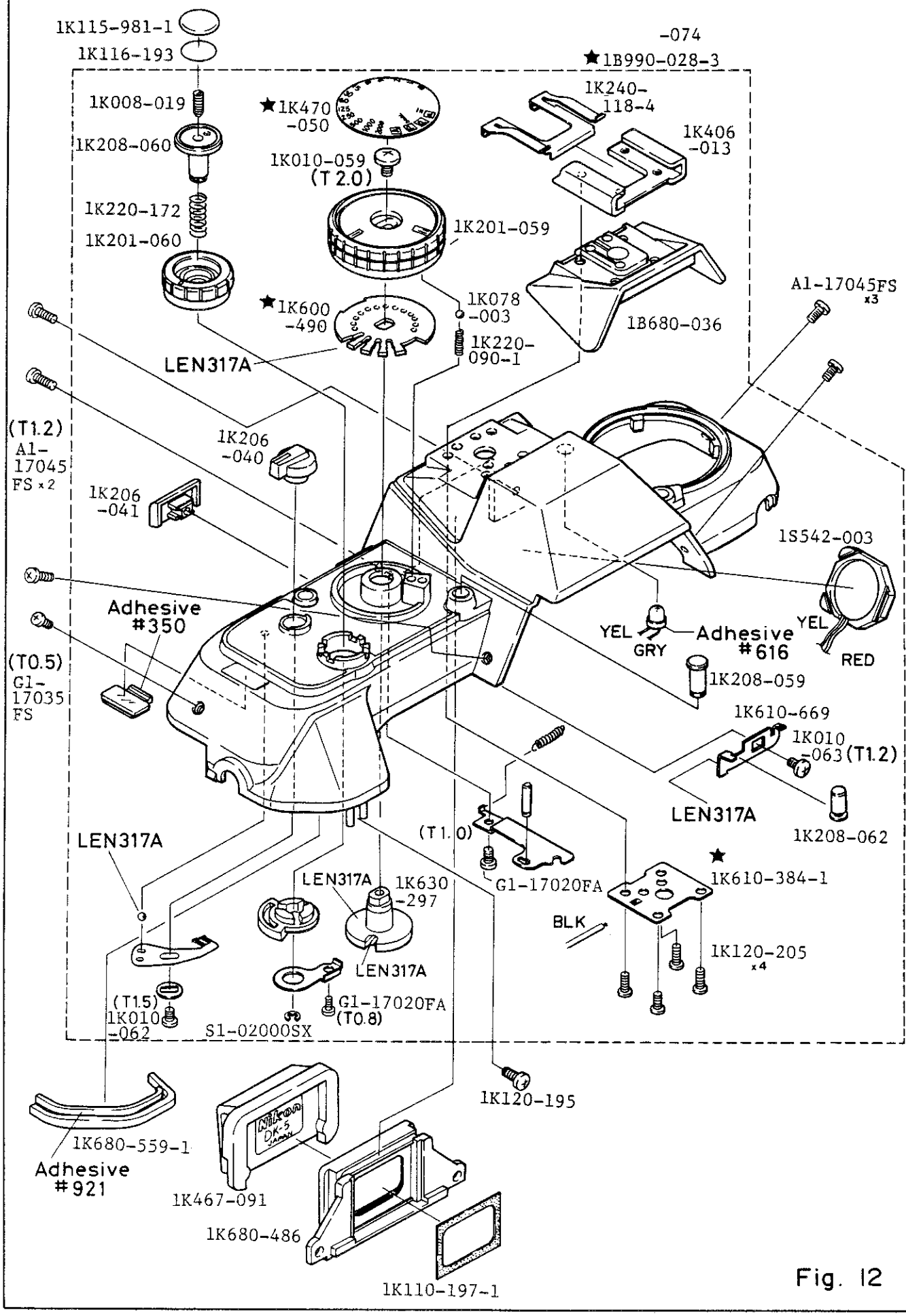

1K115-981-1
1K116-193
1K008-019
1K208-060
1K220-172
1K201-060
★1K470
-050
1K010-059
(T2.0)
1K201-059
★1K600
-490
1K078
-003
1K220-
090-1
LEN317A
-074
★1B990-028-3
1K240-
118-4
1K406
-013
1B680-036
A1-17045FS
x3
(T1.2)
A1-
17045
FS x2
1K206
-040
1K206
-041
Adhesive
#350
(T0.5)
G1-
17035
FS
1S542-003
YEL
GRY
Adhesive
#616
YEL
RED
1K208-059
1K610-669
1K010
-063(T1.2)
1K208-062
LEN317A
(T1.0)
G1-17020FA
★1K610-384-1
BLK
1K120-205
x4
LEN317A
LEN317A
1K630
-297
LEN317A
(T1.5)
1K010
-062
S1-02000SX
G1-17020FA
(T0.8)
1K120-195
1K680-559-1
Adhesive
#921
1K467-091
1K680-486
1K110-197-1

Fig. 12

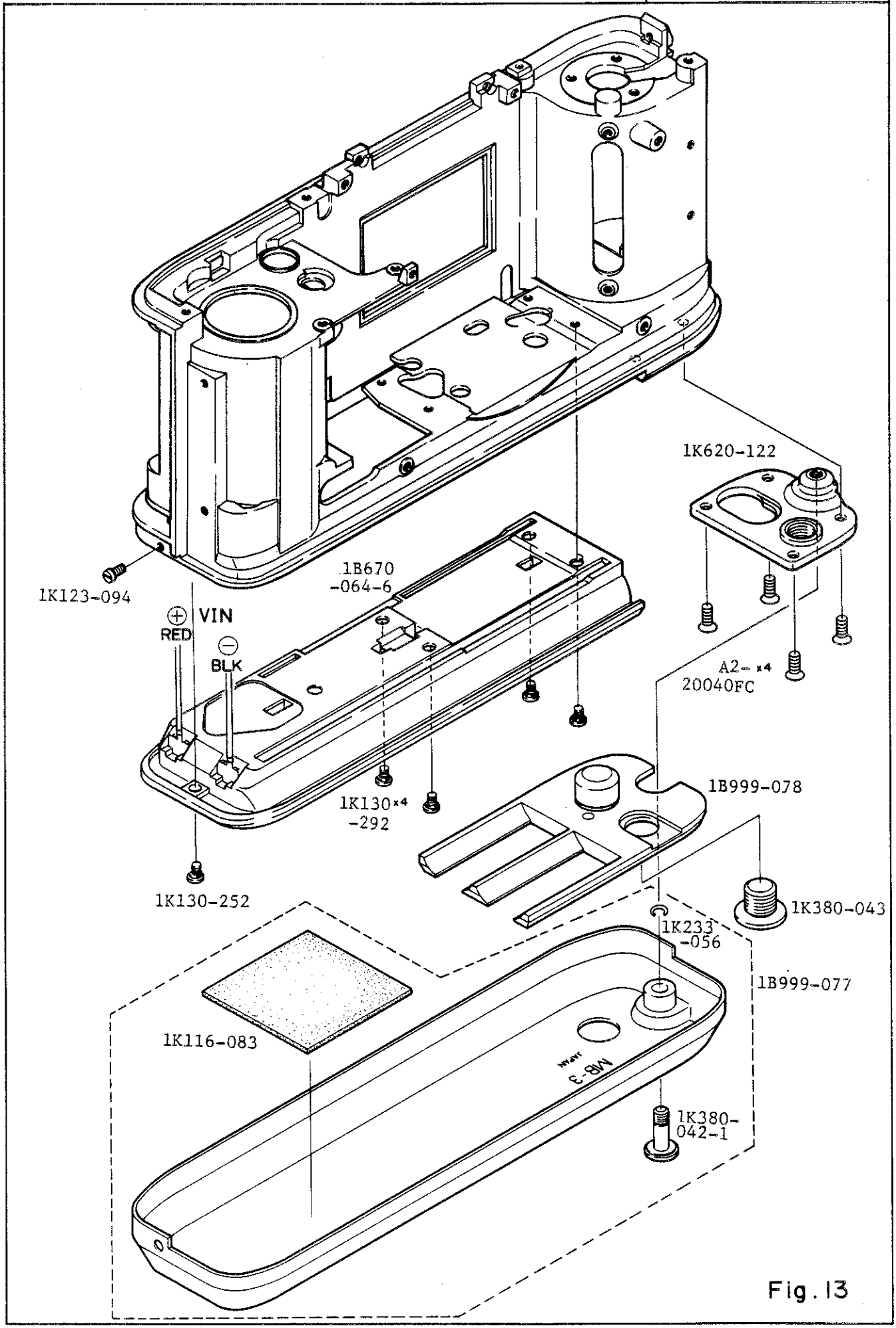
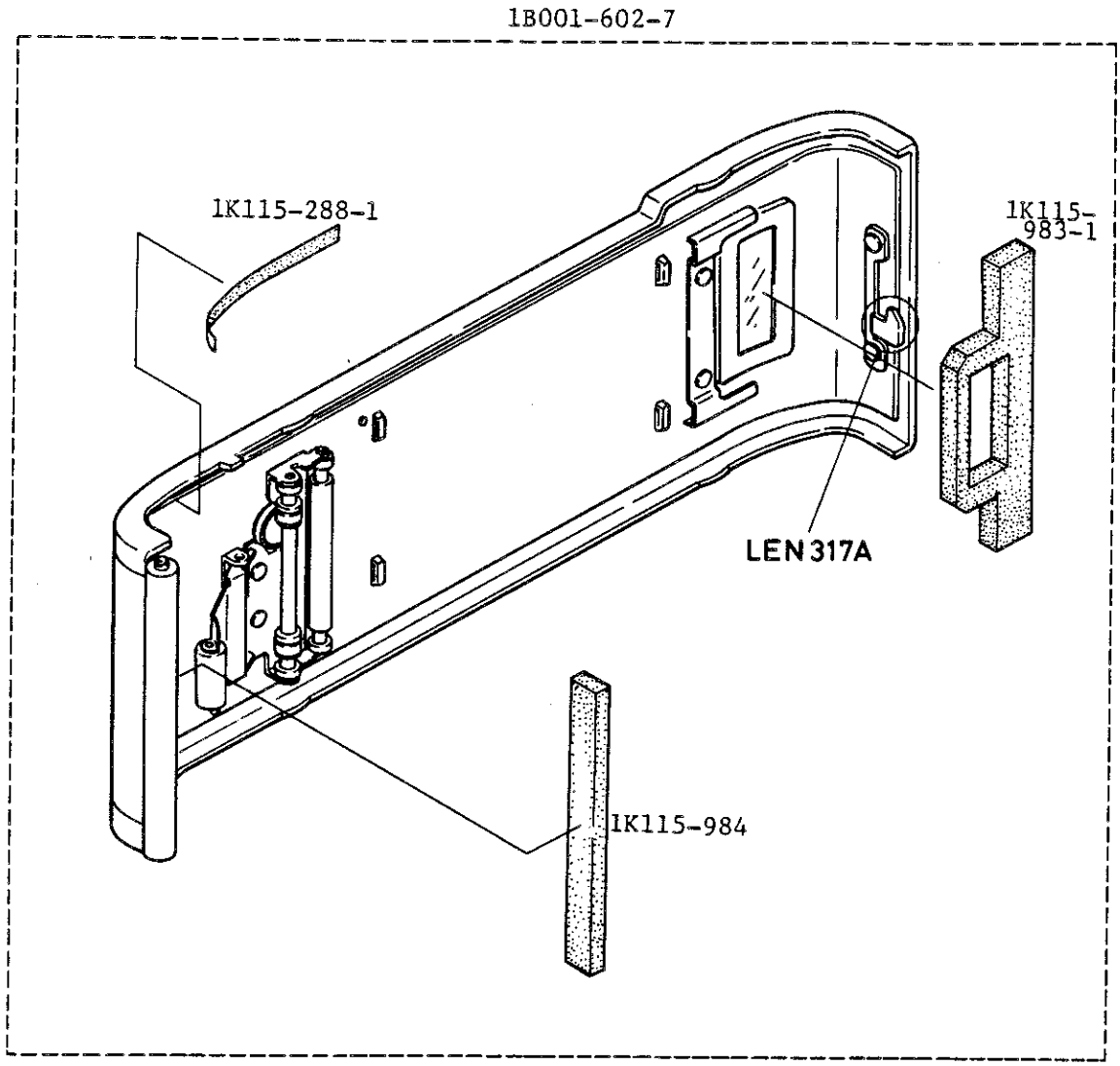

1K620-122
1K123-094
1B670
-064-6
VIN
RED
BLK
A2- x4
20040FC
1K130x4
-292
1B999-078
1K130-252
1K380-043
1K233
-056
1B999-077
1K116-083
MB-3
1K380-
042-1

Fig. 13


1B001-602-7
1K115-288-1
1K115-983-1
LEN317A
1K115-984

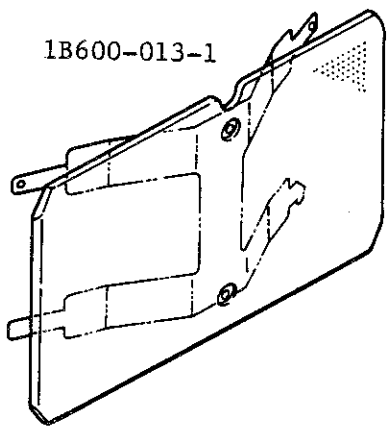

1B600-013-1

Fig. 14

部品対照表 Parts Number Reference Table

補助番号 Auxiliary Number	部品番号 Part Number
22	1K999-015-1
34	1K120-223
35	1K680-559-1
37	1K680-468
38	1K600-536
39	1K680-636 -1
47	1K277-015
48	1K277-016
49	1K277-017
50	1K277-018
55	1K230-197
59	1K275-044-1
60	1K640-529-1
61	1K275-045
62	1K370-930
64	1K220-166-1
65	1K050-214
66	1K340-124-1
67	1K260-232
74	1K120-195
95	1K230-155
108	1K240-367-3
127	1K230-158
129	1K475-283-1
131	1K480-024
133	1K230-159
134	1K120-078
135	1K230-160
136	1K230-161
142	1K240-368-2
143	1K610-700
153	1K240-369-1
154	1K240-370-4
156	1K600-440
174	1K165-095
155	1K625-054

補助番号 Auxiliary Number	部品番号 Part Number
206	1K115-993-1
207	1K120-224
208	1K610-657-1
217	1K240-373
220	1K680-482
221	1K314-224-1
222	1K220-038-1
227	1K610-658-1
233	1K100-035-1
234	1K080-005
235	1K044-003
237	1K680-473
238	1K610-659
239	1K123-092-1
241	1K115-974-1
242	1K115-975-1
243	1K115-976-1
265	1K123-094
275	1K620-122
281	1K116-257
282	1K116-258
283	1K116-259
284	1K116-218
285	1K116-261
304	1K225-100
306	1K225-101-2
310	1K225-102-2
321	1K610-733
323	1K314-230-1
337	1K233-052
351	1K230-065-1
378	1K225-103-1
382	1K130-248
387	1K120-225
388	1K130-249

補助番号 Auxiliary Number	部品番号 Part Number
405	1K123-093
406	1K220-173
410	1K230-196
415	1K610-665-1
416	1K116-245
417	1K116-249
421	1K680-489-1
422	1K116-017-1
425	1K470-047
426	1K610-781
427	1K233-050
428	1K116-223
429	1S727-006
431	1K680-486
432	1K110-197-1
433	1K467-091
436	1K610-794
437	1K610-714-2
441	1K208-072
442	1K600-537
443	1K370-966-1
444	1K130-288-1
445	1K220-201-1
446	1K220-041
451	1K208-073
452	1K208-074
453	1S758-009-1
455	1K116-248
456	1K680-474-1
469	1K467-042
470	1K146-082
471	1K404-071-1
472	1K240-468-1
473	1K123-046
475	1K123-104-1
476	1K620-124
477	1K240-461
478	1K240-462

部品対照表 Parts Number Reference Table

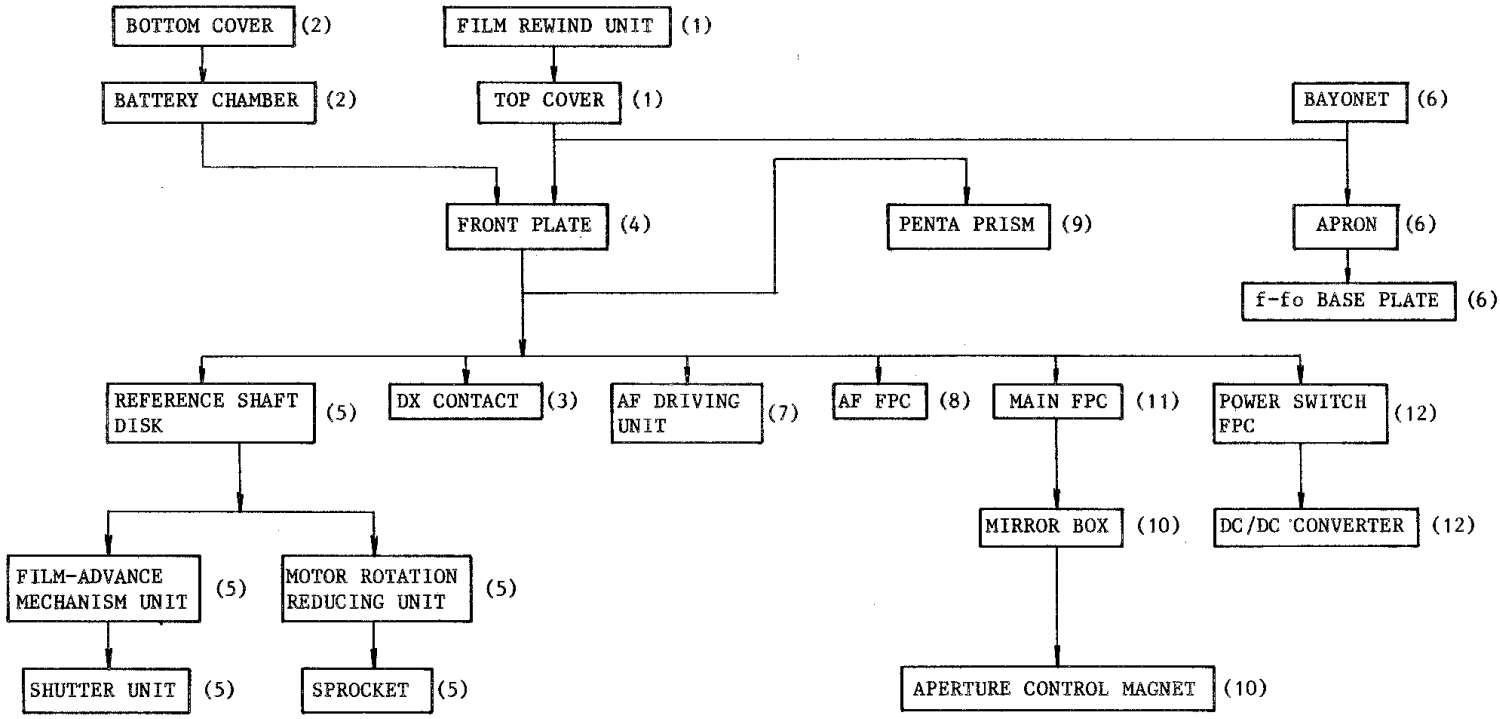
補助番号 Auxiliary Number	部品番号 Part Number
479	1K370-938
484	1K225-112
485	1K630-299
495	1K225-139
501	1K370-822
502	1K220-089
511	1K201-059
512	1K470-050
513	1K630-297
514	1K010-059
515	1K208-059
518	1K600-490
519	1K220-090-1
521	1K201-060
526	1K206-040
531	1K208-060
532	1K115-981-1
533	1K008-019
534	1K116-193
535	1K220-172
544	1K475-284
546	1K060-035
556	1K120-042
561	1K201-062-1
562	1K146-081
564	1K240-330
568	1K370-824
569	1K050-173
571	1K406-013
573	1K240-118-4
576	1K610-384-1
577	1K120-205
581	1K208-062
582	1K206-041
583	1K610-669
607	1K115-983-1
628	1K115-984

補助番号 Auxiliary Number	部品番号 Part Number
631	1K115-288-1
662	1K600-446-1
663	1K110-200
664	1K110-215
668	1K120-206
673	1K620-126
674	1K116-224
680	1K116-239-1
681	1K115-660-1
683	1K116-124
684	1K680-597
685	1K116-166
686	1K240-452
701	1K010-060
702	1K010-061
703	1K123-091
704	1K010-062
705	1K010-063
706	1K120-210
707	1K130-252
708	1K130-258
709	1K120-009
710	1K010-002-1
711	1K050-048
711	1K050-029
712	1K130-289
713	1K165-106-1
714	1K120-015
715	1K130-290
716	1K640-638
717	1K165-107-1
718	1K650-012
751	S1-01200SX
754	S1-01500SX
755	S1-00800SX
756	S1-02000SX
757	1K060-003

補助番号 Auxiliary Number	部品番号 Part Number
760	1K130-292
761	1K050-022
761	1K050-112
761	1K050-144
772	1K078-003
801	A2-20040FC
802	A1-17025FA
803	A1-17040FB
804	B1-17030FA
805	A1-14030FS
806	A1-20050FS
808	A2-17022FC
809	B1-17035FB
811	B1-17040FB
812	A1-14014FB
813	B1-17055FB
814	B1-20030FB
815	A1-20035FB
817	A1-17045FB
818	H1-17035FA
819	H2-17035FA
820	B1-14015FA
824	G1-17035FS
825	A1-17045FS
833	B1-14030FD
837	A1-17020FS
839	B1-17025FA
842	G1-14020FB
843	K1-14020FB
845	B1-14014FB
851	B1-17016FB
855	G1-17020FA
859	A2-17025FC
860	A1-14020FA

1. DISASSEMBLING OUTLINE

Note: Numbers in parentheses refer to disassembling procedures.



部品対照表 Parts Number Reference Table

補助番号 Auxiliary Number	部品番号 Part Number
906	1K630-365
914	1K260-255
915	1K130-285
916	1K260-256
921	1K600-533
926	1K370-962
928	1K230-193
929	1K116-241-1
930	1K240-465-1
933	1K165-105
935	1K314-262-1
938	1K130-286
944	1K230-195
945	1K130-287
946	1K300-067
948	1K206-044
949	1K116-242
950	1K116-243
951	1K120-226
953	S3-01500FY
956	1K123-103
984	1K600-534
985	1K050-246
988	1K050-065
1001	1S705-043
1003	1S705-042-2
1004	1S705-045
1005	1S705-046
1021	1S050-006
1023	1S542-003
1025	1S260-025-1
1026	1S260-028
1028	1S260-027
1133	1S322-064

補助番号 Auxiliary Number	部品番号 Part Number
G1	1G571-001
G3	1G950-043
G4	1G415-008-1
G5	1G131-002-1
G7	1G138-001-1
MB2	1K240-375
MB12	1K380-040-1
MB13	1K116-083
MB14	1K233-056
MB32	1K380-042-1
MB310	1K380-043

補助番号 Auxiliary Number	部品番号 Part Number
B23	1B990-028-3
B23	1B999-074
B26	1B999-072
B32	1B260-028-1
B41	1B990-067
B51	1B001-645
B52	1B314-131
B71	1B260-029
B72	1B370-013
B81	1B990-035-1
B83	1B314-122
B121	1B990-036-2
B158	1B990-037-1
B165	1B640-031
B202	1B990-038-3
B211	1B680-044
B231	1B001-085
B251	1B670-064-6
B301	1B990-041-2
B319	1B240-034
B324	1B310-042-2
B341	1B990-046-2
B345	1B260-031-1
B349	1B277-005
B353	1B277-012
B355	1B001-572-1
B420	1B680-038-1
B467	1B630-032
B474	1B610-035-1
B482	1B640-037
B505	1B060-282-3
B542	1B640-029-1
B549	1B990-050-1
B550	1B640-032
B558	1B990-051-1

部品対照表 Parts Number Reference Table

補助番号 Auxiliary Number	部品番号 Part Number	補助番号 Auxiliary Number	部品番号 Part Number	補助番号 Auxiliary Number	部品番号 Part Number
B561	1B990-052-1				
B563	1B201-023-1				
B572	1B680-036				
B601	1B001-602-7				
B603	1B600-013-1				
B665	1B990-054-1				
B901	1B060-283				
B902	1B610-039				
B919	1B990-064				
B922	1B060-284				
B924	1B610-040				
B925	1B990-065				
B934	1B001-642-3				
B1001	1S007-080-1				
B1004	1S007-082-2				
B1131	1S045-050				
B1132	1B060-285				
B1136	1S007-086				
B1137	1S007-087				
B2331	1B990-059-2				
B2901	1B990-066				
B4002	1B990-062				
B1021	1S050-006				
BMB11	1B990-029-2				
BMB31	1B999-077				
BMB32	1B999-078				
BMB280	1B990-039				

PARTS LIST

Contents

[1] PARTS LIST P1

[2] SUBASSEMBLY LIST P29

部 品 表 Parts list

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K008-019	レリーズ釦軸 Release button shaft	1	1B990-028-3	12	○△	F-301	5
* 1K010-002-1	Screw	4		8	○	F-301	10
* 1K010-059	Tダイヤルビス Screw, shutter dial	1	1B990-028-3	12	○△	F-301	10
* 1K010-060	減速ギア基板ビス Screw, reduction gear base plate	3	1B990-067	2	○△	F-301	10
* 1K010-061	上地基板ビス Screw, film-advance lever	1		10	○	F-301	10
* 1K010-062	音消しレバービス Screw, rewind lock lever	1	1B990-028-3	12	○△	F-301	10
* 1K010-063	Rロックレバービス Screw, rewind lock lever	1	1B990-028-3	12	○△	F-301	10
* 1K044-003	耳環圧入ピン Press-fit pin, eyelet	2	1B999-072	4	○△	F-301	10
* 1K050-022	チリトリガタ取りワッシャー B Washer, mirror holder 0.8 × 1.9 × 0.2	0~1	1B999-072	7	○△	F-301	10
* 1K050-029	46.5 調整用ワッシャー A Washer A 2.1 × 3.8 × 0.05	0~4		8	○	F-301	10
* 1K050-030	46.5 調整用ワッシャー B Washer B 2.1 × 3.8 × 0.06	0~4		8	○	F-301	10
* 1K050-031	46.5 調整用ワッシャー C Washer C 2.1 × 3.8 × 0.07	0~4		8	○	F-301	10
* 1K050-032	46.5 調整用ワッシャー D Washer D 2.1 × 3.8 × 0.08	0~4		8	○	F-301	10

要求単位

部 品 表 Parts list

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K050-033	46.5 調整用ワッシャー E Washer E 2.1×3.8×0.09	0~4		8	○	F-301	10
* 1K050-034	46.5 調整用ワッシャー F Washer F 2.1×3.8×0.1	0~4		8	○	F-301	10
* 1K050-035	46.5 調整用ワッシャー G Washer G 2.1×3.8×0.11	0~4		8	○	F-301	10
* 1K050-036	46.5 調整用ワッシャー H Washer H 2.1×3.8×0.12	0~4		8	○	F-301	10
* 1K050-037	46.5 調整用ワッシャー I Washer I 2.1×3.8×0.2	0~4		8	○	F-301	10
* 1K050-038	46.5 調整用ワッシャー J Washer J 2.1×3.8×0.3	0~4		8	○	F-301	10
* 1K050-039	46.5 調整用ワッシャー K Washer K 2.1×3.8×0.4	0~4		8	○	F-301	10
* 1K050-040	46.5 調整用ワッシャー L Washer L 2.1×3.8×0.5	0~4		8	○	F-301	10
* 1K050-041	46.5 調整用ワッシャー M Washer M 2.1×3.8×0.6	0~4		8	○	F-301	10
* 1K050-042	46.5 調整用ワッシャー N Washer N 2.1×3.8×0.7	0~4		8	○	F-301	10
* 1K050-043	46.5 調整用ワッシャー O Washer O 2.1×3.8×0.8	0~4		8	○	F-301	10
* 1K050-044	46.5 調整用ワッシャー P Washer P 2.1×3.8×0.9	0~4		8	○	F-301	10
* 1K050-045-1 (1K050-045)	46.5 調整用ワッシャー Q Washer Q 2.1×3.8×1	0~4		8	○	F-301	10

部 品 表 Parts list

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K050-046-1 (1K050-046)	46.5 調整ワッシャー R Washer R 2.1×3.8×1.1	0~4		8	○	F-301	10
* 1K050-047-1 (1K050-047)	46.5 調整ワッシャー S Washer S 2.1×3.8×1.2	0~4		8	○	F-301	10
* 1K050-048	46.5 調整ワッシャー T Washer T 2.1×3.8×0.03	0~4		8	○	F-301	10
* 1K050-065	座 金 Washer	1	1B999-072		○△	FG	10
* 1K050-112	チリトリガタ取りワッシャー C Washer, mirror holder 0.8×1.9×0.3	0~1	1B999-072	7	○△	F-301	5
* 1K050-144	チリトリガタ取りワッシャー A Washer, mirror holder 0.8×1.9×0.1	0~1	1B999-072	7	○△	F-301	10
* 1K050-173	巻戻しノブ座金 Washer, rewind knob 3.1×7×0.7	1		11	○	F-301	10
* 1K050-214	スプロケットワッシャー Sprocket washer 3.3×4.8×0.5	1		3	○	F-301	5
1K050-246	基板取付座 B Mount B	1	1B999-072	5	○△		10
* 1K060-003	レンズ着脱Eリング E-ring	2	1B999-072	5	○△	F-301	10
* 1K060-035	ISO内環止メ輪 Stopper ring	1		11	○	F-301	5
* 1K078-003	Tダイヤル音消しクリックボール Click ball, shutter dial	2	1B990-028-3	12	○△	F-301	10
* 1K080-005	三角環飾りモールド Neckstrap protector	2		4	○	F-301	10

部 品 表 Parts list

FAA 20051 — R. 3176. A

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K100-035-1 (1K100-035)	三角環 Neckstrap ring	2		4	○	F-301	5
* 1K110-197-1 (1K110-197)	接眼窓モールド遮光ゴム Light-tight rubber, eyepiece	1		12	○	F-301	5
* 1K110-200	メインフレキ圧接下ゴム Press-contact rubber	1		9	○	F-301	5
* 1K110-215	メインフレキ圧接上ゴム Press-contact rubber	1	1B990-036-2 1B990-062-2	10	○△	F-301	5
* 1K115-288-1	裏蓋カウンター遮光紙 Light baffle, camer back counter	1	1B001-602-7	14	○△	F-301	50
* 1K115-660-1 (1K115-660)	アセテートクロステープ Tape	4	1B999-072	5, 8, 9	○△	F-301	10
* 1K115-974-1	裏蓋溝上モルト A Sponge strip A, camera back (top)	1		1	○	F-301	5
* 1K115-975-1	裏蓋溝上モルト B Sponge strip B, camera back (top)	1		1	○	F-301	5
* 1K115-976-1	裏蓋溝下モルト Sponge strip, camera back (bottom)	1		1	○	F-301	5
* 1K115-981-1	レリーズ釦飾り板 Cover plate, shutter release button	1		12	○	F-301	5
* 1K115-983-1	裏蓋窓モルト Sponge strip, camera back	1	1B001-602-7	14	○△	F-301	5
* 1K115-984	裏蓋遮光モルト A Right-tight sponge A, camera back	1	1B001-602-7	14	○△	F-301	5
* 1K115-993-1	フィルム先端指標 Film leader index	1		1	○	F-301	5

部 品 表 Parts list

FAA 20051 — R. 3176. A

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K116-017-1 (1K116-017)	接眼マスク Eyepiece mask	1		8	○	F-301	5
* 1K116-025	底カバーモルト Sponge strip, bottom cover	1	1B990-029-2	13	○△	F-301	5
* 1K116-124	両面テープ Adhesive double coated tape	3	1S007-080	8	○△	F-301	1
* 1K116-166	AE LED 圧接ゴム Press contact rubber	1		9	○	F-301	5
* 1K116-193	レリーズ釦飾り板テープ Adhesive double coated tape	1		12	○	F-301	5
* 1K116-218	前カバーゴムB用テープb Tape, front cover	1		9	○	F-301	5
1K116-223	ペンタ押えシート Pentaprism seat	1		8	○		5
1K116-224	AF フレキ圧接ゴム Press-contact rubber, AF FPC	2		9	○		5
1K116-239-1	上地フレキグリップ部絶縁テープ Tape, power sw FPC	2	1B999-072	1,10	○△		5
1K116-241-1	防振ゴム Rubber, vibration isolation	1	1B999-072	5	○△		5
1K116-242	S/C 飾り板 Plate, S/C lever	1		4	○		5
1K116-243	S/C 銘板 Name plate, S/C lever	1		4	○		5
1K116-245	ミラーアップ受モルトA Sponge strip A, mirror	1	1B999-072	8	○△		5

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1K116-248	AFL フレキSW部接着テープ Tape, AF lock sw	1	1B999-072	5	○△		5
1K116-249	ミラーアップ受モルトB Sponge strip B, mirror	1	1B999-072	8	○△		5
1K116-257	前カバーゴムA用テープ a Tape a, front cover rubber a	1		9	○		5
1K116-258	前カバーゴムA用テープ b Tape b, front cover rubber b	1		9	○		5
1K116-259	前カバーゴムB用テープ a Tape a, front cover rubber a	1		9	○		5
1K116-261	グリップカバー用接着テープ Tape, grip cover	1		9	○		5
* 1K120-009	fo ばねビス Screw, fo spring	2	1B999-072	4	○△	F-301	10
* 1K120-015	基板連結ビス Screw, AF motor unit	2	1B990-066 1B999-072	5	○△	FE2	10
* 1K120-042	ISO ロック板ビス Screw, ISO lock plate	2		11	○	F-301	10
* 1K120-078	カウンタービス Frame counte screw	1	1B990-036-2 1B990-062-2	10	○△	F-301	10
* 1K120-195	基準軸ビス 上カバービスC Screw C, top cover	2		3	○	F-301	10
* 1K120-205	シュービス Screw, accessory shoe	4	1B990-028-3	12	○△	F-301	10
1K120-206	圧接ビス Screw, press contact	2		9	○		10

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
*1K120-210	ƒ㎜基板ビス Screw	2	1B990-046-2 1B999-072	6	○△		10
*1K120-223	フィルムガイドピン Screw, film guide	1		1	○	F-301	10
*1K120-224	フィルムガイド板座ビス Screw, film guide	2		1	○	F-301	10
*1K120-225 (1K120-081)	P.SW プリント板ビス Screw, program switch printed circuit	1	1B999-072	6	○△	F-301	10
1K120-226	S/C ビス Screw S/C lever	1	1B999-072	4	○△		10
*1K123-046	バヨネットビスA Screw A, bayonet ring	4	1B999-072	4	○△	F-301	10
*1K123-091	電源SW, レリーズSWビス Screw, power switch and release switch	3	1B990-062-2	10	○△	F-301	10
1K123-092-1	DB 識別ビス Screw, DB contact	1		1	○		5
1K123-093	TCL ビス Screw, TCL module	3		6	○		5
*1K123-094	底カバー着脱ピン Bottom cover release pin	1		13	○	F-301	5
1K123-103	A/M SW ピン Screw, A/M switch	1	1B999-072	5	○△		
1K123-104-1	バヨネットビスB Screw B, bayonet ring	1	1B999-072	4	○△		
*1K130-248	P.SW プリント板止めビスA Retaining screw A, program switch printed circuit	1	1B999-072	6	○△	F-301	10

2. DISASSEMBLING PROCEDURES

Note: 1) Disassembling should be started after batteries are removed.

2) Figure numbers refer to figures in reassembling procedures.

3) Be sure to learn how the lead wires are arranged.

4) As ICs are easily affected by static electricity, be sure to ground the camera when soldering or handling.

(1) Top cover

- Rewind knob B561 — Fig.11
- Washer #569
- ISO film speed dial B542 — Fig.11
- Stopper ring #546
- T J5157
- Remove upper side of Rubber grip #37 — Fig.9
- Top cover screws — Fig.12
  - ⊕ #825x5
  - ⊕ #824x1
  - ⊕ #74x1
  - Eyepiece mold #431
  - Eyepiece light tight rubber #432
- Unsolder lead wires from top cover — Wiring diagram
  - ① DX contact lead wire #1147 (orange)
  - ② GND lead wire #1148 (black)
- Unsolder lead wires from main FPC — Wiring diagram
  - 1 Stop signal contact lead wire #1150 (brown)
  - 2 Ready-light contact lead wire #1149 (pink)
  - 3 TTL contact lead wire #1151 (green)
  - 4 "M" LED lead wire #1175 (yellow)
  - 5 "M" LED lead wire #1176 (gray)
  - 6 Buzzer lead wire (yellow)
  - 7 Silencer switch lead wire #1155 (red)
- Top cover B023 — Fig.12

(2) Bottom cover

- Bottom cover — Fig.13
- Unscrew battery chamber screws — Fig.13
  - ⊕ #707x5
- Unsolder lead wires from battery chamber — Wiring diagram
  - (+) Lead wire #1192 (red)
  - (−) Lead wire #1194 (black)
- Battery chamber B251 — Fig.13

(3) DX contact

- Front plate
- DX contact B211 — Fig.1
  - ⊕ Screw #813x2

部 品 表 Parts list

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K130-249	L基板止めビスA Retaining screw A, printed circuit	1	1B999-072	7	○△	F-301	10
* 1K130-252	電池室ビス Screw, battery chamber	1		13	○	F-301	10
* 1K130-258	モータービス Screw, motor	2	1B990-067	2	○△	F-301	10
1K130-285	ギヤC軸 Gear C shaft	1	1B999-072	5	○△		
1K130-286	第1レバー基板ビス Screw	1	1B999-072	5	○△		
1K130-287	S/C 軸 S/C shaft	1	1B999-072	4	○△		
1K130-288-1	レンズ着脱釦軸 Axle, lens release button	1	1B999-072	5	○△		
1K130-289	モーター基板ビス Screw	2	1B999-072	5	○△		
* 1K130-292	電池室ビス Screw, battery chamber	4		13	○	F-301	
* 'K146-081	巻戻しノブビス Rewind knob screw	1	1B990-052	11	○△	F-301	5
* 1K146-082	リモートコネクター止めビス Retaining screw, remote	1	1B999-072	4	○△	F-301	5
* 1K165-095	カウンターSW絶縁ワッシャー Insulating washer, frame counter switch (t =0.1)	1	1B990-062-2	10	○△	F-301	5
1K165-105	ギヤ止めワッシャー Gear, retaining washer	1	1B999-072	5	○△		5

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1K165-106-1	モーター基板ビス座 Washer, motor base plate	1	1B999-072	5	○△		5
* 1K201-059	T ダイヤル Shutter dial	1	1B990-028-3	12	○△	F-301	5
* 1K201-060	S/C 切換ダイヤル S/C selector ring	1	1B990-028-2	12	○△	F-301	5
* 1K201-062-1	巻戻しノブ Rewind knob	1	1B990-052	11	○△	F-301	5
* 1K206-040	音消しレバー Silencer lever	1	1B990-028-3	12	○△	F-301	5
* 1K206-041	R ロックレバー Rewind lock lever	1	1B990-028-3	12	○△	F-301	5
1K206-044	S/C レバー S/C lever	1	1B999-072	4	○△		5
* 1K208-059	T ダイヤルロック解除釦 Release button, sutter dial lock	1	1B990-028-3	12	○△	F-301	5
* 1K208-060	レリーズ釦 Shutter release button	1	1B990-028-3	12	○△	F-301	5
* 1K208-062	R 釦 Rewind button	1	1B990-028-3	12	○△	F-301	5
1K208-072	レンズ着脱釦 Lens release button	1	1B999-072	5	○△		5
1K208-073	AEL 釦 Button, AE memory lock	1	1B999-072	4	○△		5
1K208-074	AFL 釦 Button, A F lock	1	1B999-072	4	○△		5

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K220-038-1	裏蓋開閉キーばね Spring, camera back O/C key	1		1	○	F-301	10
* 1K220-041	レンズ着脱ピンばね Spring, lens release pin	1	1B999-072	5	○△	F-301	10
* 1K220-089	EE 識別ピンばね Spring, EE lens pin	1	1B999-072	4	○△	F-301	10
* 1K220-090-1	T ダイヤルクリックばね Click spring, shutter dial	1	1B990-028-3	12	○△	F-301	10
* 1K220-166-1	スプロケットばね Sprocket spring	1		3	○	F-301	5
* 1K220-172	レリーズ釦ばね Spring, shutter release button	1	1B990-028-3	12	○△	F-301	5
1K220-173	TCL ばね TCL spring	3		6	○		10
1K220-201-1	レンズ着脱ボタン軸ばね Spring, lens release button axle	1	1B999-072	5	○△		10
1K225-100	ミラーアップばね Mirror-up spring	1	1B990-041-2 1B999-072	7	○△		5
* 1K225-101-2 (1K225-101)	絞りレバー戻しばね Aperture lever spring	1	1B990-041-2 1B999-072	7	○△	F-301	5
* 1K225-102-2 (1K225-102)	絞りレバー駆動ばね Aperture lever actuating spring	1	1B990-041-2	7	○△	F-301	5
* 1K225-103-1	絞り制御リセット板コイルばね Coil spring, aperture control reset plate	1	1B990-046-2 1B999-072	6	○△	F-301	5
* 1K225-112	運動環ばね Spring, aperture coupling ring	1	1B640-037 1B999-072	4	○△	F-301	5

部 品 表 Parts list

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K225-139	fo ばね fo spring	1	1B999-072	4	○△	F-301	5
* 1K230-065-1 (1K230-065)	絞り制御ギヤ Bばね Spring, aperture control gear B	1	1B990-046-2 1B999-072	6	○△	F-301	10
* 1K230-155	巻上制限係止レバーバネ Spring, film-advance lath lever	1	1B990-035-1	3	○△	F-301	10
* 1K230-158	巻上制限レバーばね Spring, film-advance stopper lever	1	1B990-036-2 1B990-062-2	10	○△	F-301	5
* 1K230-159	カウンターばね Frame counter spring	1	1B990-036-2 1B990-062-2	10	○△	F-301	5
* 1K230-160	巻上制限ワイヤー SW Wire switch, film-advance stopper	1	1B990-062-2	10	○△	F-301	5
* 1K230-161	カウンターワイヤー SW Wire switch, frame counter	1	1B990-062-2	10	○△	F-301	5
1K230-193	第2レバーばね Spring, 2nd lever	1	1B999-072	5	○△		5
1K230-195	S/C 接点板ばね Spring, S/C contact	1	1B999-072	4	○△		5
1K230-196	主ミラーダウンばね Main spring, mirror down	1	1B999-072	7	○△		5
1K230-197	Sチャージレバーばね Spring, shutter charge lever	1	1B001-645 1B990-067	2	○△		5
* 1K233-050	ペンタ押えばね Retaining spring pentaprism	1		8	○	F-301	5
1K233-052	サブミラーばね Spring, sub mirror	1	1B990-059-1 1B999-072	7	○△		5

部 品 表 Parts list

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K233-056	線ばね Spring	1	1B990-029-2	13	○△	F-301	5
* 1K240-118-4 (1K240-118-3)	シューばね Spring, accessory shoe	1	1B990-028-3	12	○△	F-301	10
* 1K240-330	巻戻しクランクレバーばね Spring, rewind crank	1	1B990-052	11	○△	F-301	10
* 1K240-367-3	カウンター送りギヤばね Spring, frame counter advance gear	1	1B990—035-1	3	○△	F-301	5
* 1K240-368-2	AR ばね AR spring	1		10	○	F-301	5
* 1K240-369-1	レリーズ SW Release switch	1	1B990-062-2	10	○△	F-301	5
* 1K240-370-4	半押し SW Power hold switch	1	1B990-062-2	10	○△	F-301	5
* 1K240-373	パトローネ保持ばね Retaining spring, patorone	1		1	○	F-301	5
* 1K240-375	電池ホルダーばねB Spring, battery holder	2	1B990-039		○△	F-301	5
* 1K240-452	AE LED 圧接ばね Spring, press contact AE LED	1		9	○	F-301	5
1K240-461	スクリーン枠係止板 Holding plate	1		8	○		5
1K240-462	スクリーン枠支持板 Screen frame, supporting plate	1		8	○		5
1K240-465-1	相対距離信号押えばね Spring relative distance signal	1	1B990-066 1B999-072	5	○△		5

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1K240-468-1	バヨネットばね Spring, bayonet ring	1	1B999-072	4	○△		5
* 1K260-232	スプロケットギヤ Sprocket gear	1		3	○	F-301	5
1K260-255	ギヤC Gear C	1	1B999-072	5	○△		5
1K260-256	ギヤB Gear B	1	1B999-072	5	○△		5
* 1K275-044-1 (1K275-044)	スプール Spool	1	1B990-067	2	○△	F-301	5
* 1K275-045	スプロケット Sprocket	1		3	○	F-301	5
* 1K277-015	減速ギヤB Reducing gear B	1	1B990-067	2	○△	F-301	5
* 1K277-016	減速ギヤC Reducing gear C	1	1B990-067	2	○△	F-301	5
* 1K277-017	減速ギヤD Reducing gear D	1	1B990-067	2	○△	F-301	5
* 1K277-018	減速ギヤE Reducing gear E	1	1B990-067	2	○△	F-301	5
1K300-067	S/C 切換カム S/C exchanging cam	1	1B999-072	4	○△		
* 1K314-224-1	裏蓋開閉キー Camera back O/C key	1		1	○	F-301	5
* 1K314-230-1	絞り制御連結レバー Aperture control coupling lever	1	1B999-072	7	○△	F-301	5

部 品 表 Parts list

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1K314-262-1	連動レバー Coupling lever	1	1B001-642-1	5	○△		5
* 1K340-124-1	スプロケット下軸受 Bearing, sproket lower shaft	1		3	○	F-301	5
* 1K370-822	EE 識別ピン EE lens pin	1	1B999-072	4	○△	F-301	5
* 1K370-824	巻戻しフォーク軸 Rewind folk shaft	1	1B990-051-1	11	○△	F-301	5
* 1K370-930	スプロケット軸 Sprocket shaft	1		3	○	F-301	5
1K370-938	スクリーン枠支持軸 Shaft, focusing screen frame	1		8	○		5
1K370-962	第2レバー軸 2 nd lever shaft	1	1B999-072	5	○△		5
1K370-966-1	レンズ着脱ピン Lens release pin	1	1B999-072	5	○△		
* 1K380-040-1 (1K380-040)	底カバービス Bottom cover screw	1	1B990-029-2		○△	F-301	5
1K380-042-1	ローレットネジ Screw	1	1B999-077	13	○△		5
1K380-043	三脚雄ネジ Screw	1		13	○		5
1K404-071-1	バヨネット Bayonet ring	1	1B999-072	4	○△		5
* 1K406-013	シュー Accessory shoe	1	1B990-028-3	12	○△	F-301	5

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K467-042	リモートコネクターキャップ Remote connector cap	1		4	○	F-301	5
* 1K467-091	接眼キャップ Eyepiece cap	1		12	○	F-301	5
* 1K470-047	視野枠 Viewfield frame	1		8	○	F-301	5
1K470-050	T ダイヤル目盛板 Shutter speeds indicator	1	1B990-028-3	12	○△		5
* 1K475-283-1	カウンターラチェット Frame counter ratchet	1	1B990-036-2 1B990-062-2	10	○△	F-301	5
* 1K475-284	ISO 上表示板 ISO dial, upper	1		11	○	F-301	5
* 1K480-024	カウンター指標板 Frame counter index	1	1B990-036-2 1B990-062-2	10	○△	F-301	5
* 1K600-440	レリーズSW押え板 Release switch retainer	1	1B990-062-2	10	○△	F-301	5
* 1K600-446-1	メインフレキ圧接板 Press-contact plate, main FPC	1		9	○	F-301	5
1K600-490	T ダイヤルクリック板 Click plate, shutter dial	1	1B990-028-3	12	○△		5
1K600-533	ギヤ押え板 Gear retaining plate	1	1B999-072	5	○△		5
1K600-534	基板取付座 A Mount A	1	1B999-072	5	○△		5
1K600-536	前カバーゴム A Rubber A, front cover	1		9	○		5

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1K600-537	レンズ着脱板 Lens release plate	1	1B999-072	5	○△		5
* 1K610-384-1 (1K610-384)	シュー裏打ち板 Plate, accessory shoe (bottom)	1	1B990-028-3	12	○△	FG FG-20	
* 1K610-657-1	スプロカバー板 Sproket cover	1		3	○	F-301	5
* 1K610-658-1	裏蓋ヒンジ板 Camera back hinge	1		1	○	F-301	5
* 1K610-659	DB 接点フレキ押え板 Retainer, data back contact	1		1	○	F-301	5
* 1K610-665-1	ミラー後部遮光板 Light baffle plate, mirror	1		7	○	F-301	5
* 1K610-669	R ロック板 Rewind lock plate	1	1B990-028-3	12	○△	F-301	5
* 1K610-700	AR ばね押え AR spring retainer	1		10	○	F-301	5
* 1K610-714-2	AE SPD シールド板 AE SPD shield	1		8	○	F-301	5
* 1K610-733	ミラー駆動レバーガタ防止板 Holding plate, mirror actuating lever	1	1B999-072	7	○△	F-301	5
1K610-781	ペンタ押え板 Pentaprism retaining plate	1		8	○		5
1K610-794	AE SPD 基板押えばね Spring, AE SPD base plate	1		8	○		5
* 1K620-122	三脚基板 Tripod base plate	1		13	○	F-301	5

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1K620-124	スクリーン枠 Frame, focusing screen	1		8	○		5
1K620-126	AF フレキ圧接板 Press-contact plate, AF FPC	1		9	○		5
* 1K625-054	半押しSW絶縁座 Insulating plate, power hold switch	1	1B990-062-2	10	○△	F-301	5
* 1K630-297	T ダイヤル軸 Axle, shutter dial	1	1B990-028-3	12	○△	F-301	5
* 1K630-299	運動環ばねローラー Roller, aperture coupling ring spring	1	1B999-072	4	○△	F-301	5
1K630-365	相対距離信号羽根 Blade, relative distance signal	1	1B990-066 1B999-072	5	○△		5
* 1K640-529-1	スプール上座 Spool upper cover	1	1B990-067	2	○△	F-301	5
1K640-638	ワッシャ Washer	1	1B999-072	5	○△		
1K650-012	偏心環 Eccentric ring	1	1B999-072	5	○△		
* 1K680-468	グリップゴム Rubber, grip	1		9	○	F-301	5
* 1K680-473	DB 接点座 Base, data back contact	1		1	○	F-301	5
* 1K680-474-1	セルフ窓 Self-timer window	1		9	○	F-301	5
* 1K680-482	裏蓋開閉キーカバー Cover, camera back O/C key	1		1	○	F-301	5

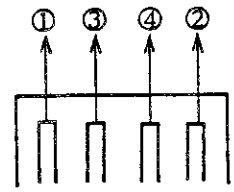
(4) Front plate

Unsolder lead wires from main FPC — Wiring diagram

1	DX lead wire	#1162	(black)	7	Shutter lead wire	(ATO)	#1145 (yellow)
2	-ditto-	#1167	(pink)	8	-ditto-	(GND)	#1142 (black)
3	-ditto-	#1166	(green)	9	-ditto-	(IS)	#1146 (purple)
4	-ditto-	#1165	(brown)	10	-ditto-	(1st Mg)	#1143 (gray)
5	-ditto-	#1164	(orange)	11	-ditto-	(V Bat)	#1141 (red)
6	-ditto-	#1163	(blue)	12	-ditto-	(2nd Mg)	#1144 (green)

Unsolder lead wires from power switch FPC — Wiring diagram

1 Motor lead wire (red)
2 -ditto- (blue)
3 Power source lead wire #1193 (black)
4 -ditto- #1191 (red)



Power switch FPC

Unsolder four lead wires from power switch FPC and data back FPC — Wiring diagram

ISO dial lock button B549 — Fig.11

⊕ Screw #556x2
ISO film speed dial B542
* Put aside ISO base plate from the rewind shaft retainer

Reatherette — Fig.9

Grip rubber #37
Front cover rubber A #38
Front rubber cover B #39

Unscrew screws of film-advance lever unit — Fig.10

⊕ Screw #819x1
⊕ Screw #818x1
⊕ Screw #702x1

Put Sprocket shaft #62 downward — Fig.3

Lift Film-advance lever unit B121 up — Fig.10

S/C lever plate #949 — Fig.4

⊖ S/C screw #951
S/C lever #948

S/C lever name plate #950 — Fig.4

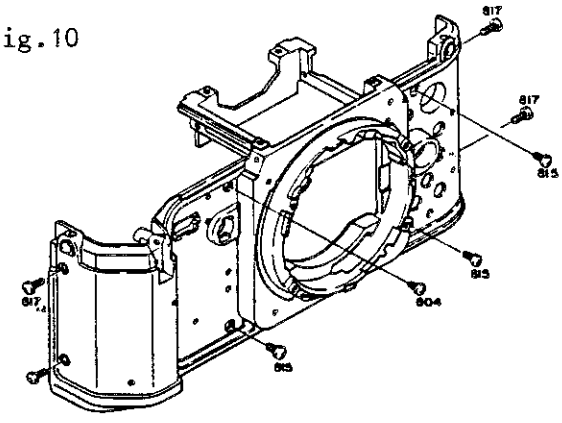
1

1

Unscrew screws of front plate — Fig.9

⊕ Screw #817x4
⊕ Screw #815x3
⊕ Screw #804x1

Front plate



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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1K680-486	接眼モールド Eyepiece mold	1		12	○	F-301	1
1K680-489-1	プリズムボックス Prism box	1		8	○		5
* 1K680-559-1	グリップ赤ライン Strip, grip red line	1	1B990-028-3	1	○△	F-301	5
* 1K680-597	AE LED圧接モールド Retaining plate AE LED	1		1	○	F-301	5
1K680-636-1	前カバーゴムB Rubber B, front cover	1		9	○		5
1K999-015-1	前カバー Front cover	1	1B999-072	4	○△		1

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
A1-14014FB	Screw	1	1B990-035	3	○△		
A1-14020FA	Screw	2		9	○		
A1-14030FS	Screw	1		1	○		
A1-17020FS	Screw	1	1B999-072	4	○△		
A1-17025FA	Screw	6	1B999-072	1, 4, 5	○△		
A1-17040FB	Screw	2		1	○		
A1-17045FB	Screw	4		9	○		
A1-17045FS	Screw	5		12	○		
A1-20035FB	Screw	5		1, 9	○		
A1-20050FS	Screw	1		1	○		
A2-17022FC	Screw	2		1	○		

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
A2-17025FC	Screw	2		3	○	
A2-20040FC	Screw	4		13	○	
B1-14014FB	Screw	1	1B990-066 1B999-071 1B999-072	5	○△	
B1-14015FA	Screw	10	1B990-062-2 1B990-066 1B999-072	5,6 9,10	○△	
B1-14030FD	Screw	2	1B999-072	5	○△	
B1-17016FB	Screw	3	1B990-046-2 1B999-072	6,7	○△	
B1-17025FA	Screw	7	1B999-072	9,7	○△	
B1-17030FA	Screw	1		9	○	
B1-17035FB	Screw	4	1B999-072	2,7	○△	
B1-17040FB	Screw	8		3,8	○	
B1-17055FB	Screw	3	1B999-072	1,7	○△	
B1-20030FB	Screw	3		11	○	

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
G1-14020FB	Screw	2		8	○	
G1-17020FA	Screw	2	1B990-028-3	12	○△	
G1-17035FS	Screw	1		12	○	
G2-17030FC	Screw	4	1B990-039		○△	
H1-17035FA	タップタイトネジ Self tapping screw	1		10	○	
H2-17035FA	タップタイトネジ Self tapping screw	1		10	○	
K1-14020FB	Screw	1		5	○	
S1-00800SX	E ring	4	1B990-064 1B060-283 1B999-071 1B999-072 1B990-066	4	○△	
S1-01200SX	E ring	8	1B001-645 1B060-283 1B260-028-1 1B990-046-2 1B990-067 1B990-066 1B990-028-3 1B999-072	2, 6, 5	○△	
S1-01500SX	E ring	2	1B310-042-2 1B999-072	7	○△	
S1-02000SX	E ring	3	1B990-062-2 1B001-642-3	10 12	○△	

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
S3-01500FY	GS - ring	1	1B999-072	4	○△	

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
1G131-003	接眼レンズ Eyepiece lens	1		8	○		1
1G138-001-1	測光レンズ Metering lens	1		7	○	F-301	1
1G415-008-1	ペンタプリズム Pentaprism	1		8	○	F-301	1
1G571-001	メインミラー Mirror	1	1B990-059-2 1B999-072	7	○△		1
1G950-043	スクリーン Focusing screen	1		8	○		1

部 品 表 Parts list

FAA 20051 — R. 3176. A

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks	
* 1S260-025-1	AE LED アレイ AE LED array	1		8, 9	○	F-301	5
* 1S260-027	セルフ表示LED Self-timer LED	1	1B990-062-2	10	○△	F-301	5
1S260-028	LED アレイ LED array	1		8	○		5
1S322-064	ISO ダイヤル基板 Base plate, ISO film speed	1		11	○		1
* 1S542-003	圧電ブザー Buzzer	1	1B990-028-3	12	○△	F-301	5
* 1S705-042-2	DB FPC Data back FPC	1		1	○	F-301	5
1S705-046	フレキシブルプリント板 （レンズ接点FPC） Lens contact FPC	1	1B999-072	5	○△		1
* 1S727-006	ペンタ絶縁シート Insulating sheet pentaprism	1		8	○	F-301	5
1S758-009-1	導電ゴム	1	1B999-072	4	○△		
* 1S810-571	リード線（赤） $\ell = 105$ Lead wire (Red)	2	1B990-028-3		×	W-0065 RE	
* 1S810-572	リード線（黒） $\ell = 100$ Lead wire (Black)	1			×	W-0065 BK	
* 1S810-573	リード線（灰） $\ell = 100$ Lead wire (Gray)	1			×	W-0065 GY	
* 1S810-574	リード線（緑） $\ell = 100$ Lead wire (Green)	1			×	W-0056 GN	
1S810-409	リード線（赤） $\ell = 30$ Lead wire (Red)	1			×	W-0056 RE	

部 品 表 Parts list

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
* 1S810-575	リード線（黄） Lead wire （Yellow） ℓ= 100	1			×	W-0056YE
* 1S810-576	リード線（紫） Lead wire （Purple） ℓ= 90	1			×	W-0056PU
* 1S810-577	リード線（橙） Lead wire （Orange） ℓ= 95	1			×	W-0056OR
* 1S810-578	リード線（黒） Lead wire （Black） ℓ= 11	1			×	W-0056BK
* 1S810-579	リード線（桃） Lead wire （Pink） ℓ= 75	1	1B990-028-3		×	W-0056PK
* 1S810-580	リード線（茶） Lead wire （Brown） ℓ= 75	1	1B990-028-3		×	W-0056BN
* 1S810-581	リード線（緑） Lead wire （Green） ℓ= 80	1	1B990-028-3		×	W-0056GN
* 1S810-582-1	リード線（青） Lead wire （Blue） ℓ= 60	1	1B060-282-2		×	W-0056BE
* 1S810-585-1	リード線（橙） Lead wire （Orange） ℓ= 25	1			×	W-0056OR
* 1S810-590-1	リード線（黒） Lead wire （Black） ℓ= 65	1	1B990-068		×	W-0056BK
* 1S810-591-1	リード線（青） Lead wire （Blue） ℓ= 45	1	1B990-068		×	W-0056BE
* 1S810-592-1	リード線（橙） Lead wire （Orange） ℓ= 50	1	1B990-068		×	W-0056OR
* 1S810-593-1	リード線（茶） Lead wire （Brown） ℓ= 55	1	1B990-068		×	W-0056BN
1S810-586-1	リード線（青） Lead wire （Blue） ℓ= 25	1			×	W-0056BE

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部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
*1S810-594-1	リード線（緑） Lead wire （Green） ℓ = 55	1	1B990-068		×	W-0056GN
*1S810-595-1	リード線（桃） Lead wire （Pink） ℓ = 60	1	1B990-068		×	W-0056PK
*1S810-598	リード線（橙） Lead wire （Orange） ℓ = 30	1	1B999-072 1S007-086		×	W-0056OR
*1S810-599-1	リード線（灰） Lead wire （Gray） ℓ = 45	1	1B680-038		×	W-0056BN
*1S810-600-1	リード線（黄） Lead wire （Yellow） ℓ = 50	1	1B680-038		×	W-0056YE
*1S810-601	リード線（黄） Lead wire （Yellow） ℓ = 60	1	1B990-028-3		×	W-0056YE
*1S810-602	リード線（灰） Lead wire （Gray） ℓ = 60	1	1B990-028-3		×	W-0056GY
*1S810-605	リード線（赤） Lead wire （Red） ℓ = 80	1			×	W-0080RE
*1S810-606	リード線（赤） Lead wire （Red） ℓ = 30	1	1B670-064-5		×	OLD W-0080RE
*1S810-607	リード線（黒） Lead wire （Black） ℓ = 75	1			×	W-0080BK
*1S810-608	リード線（黒） Lead wire （Black） ℓ = 30	1	1B670-064-5		×	OLD W-0080BK
1S810-614	リード線（緑） Lead wire （Green） ℓ = 25	1	1B990-046-2 1S007-087 1B999-072		×	W-0056GN
1S810-615	リード線（白） Lead wire （White） ℓ = 30	1	1B990-046-2 1S007-087 1B999-072		×	W-0056WH

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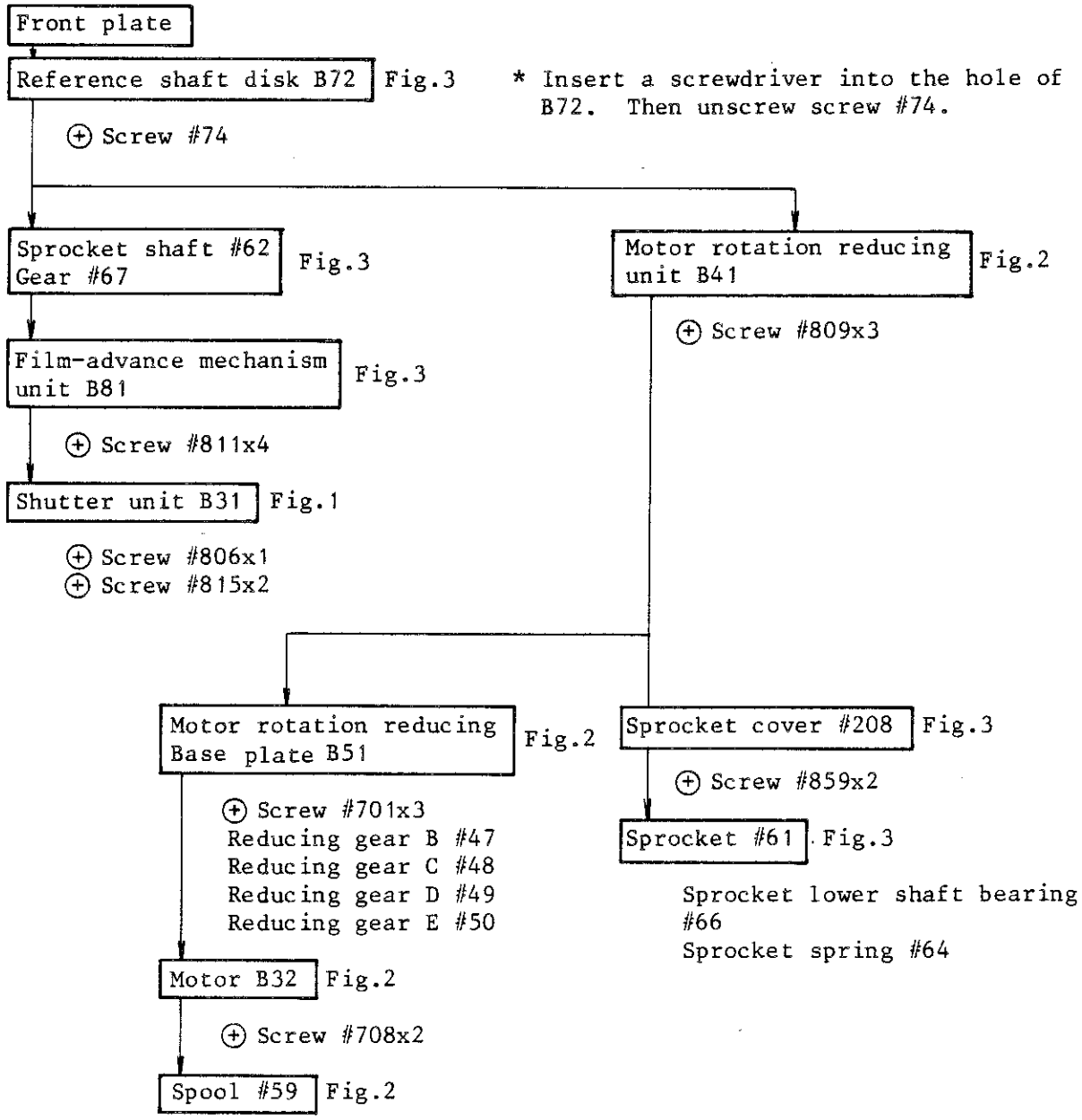
部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
1S810-753	リード線（紫） Lead wire（Purple） ℓ = 30	1	1B060-282 1B999-072		×	W-0056PU
1S810-754	リード線（黄） Lead wire（Yellow） ℓ = 30	1	1B060-282 1B999-072		×	W-0056YE
1S810-755	リード線（茶） Lead wire（Brown） ℓ = 25	1	1S045-050 1B999-072		×	W-0056BN
1S810-756	リード線（黒） Lead wire（Black） ℓ = 25	1	1S045-050 1B999-072		×	W-0056BK
1S810-757	リード線（白） Lead wire（White） ℓ = 85	1	1B060-285 1B999-072		×	W-0056WH
1S810-758	リード線（橙） Lead wire（Orange） ℓ = 85	1	1B060-285 1B999-072		×	W-0056OR
1S810-759	リード線（黒） Lead wire（Black） ℓ = 85	1	1B060-285 1B999-072		×	W-0056BK
1S810-760	リード線（橙） Lead wire（Orange） ℓ = 40	1	1B999-072		×	W-0056OR
1S810-761	リード線（黒） Lead wire（Black） ℓ = 45	1	1B999-072		×	W-0056BK
1S810-762	リード線（橙） Lead wire（Orange） ℓ = 75	1	1S045-050 1B999-072		×	W-0056OR
1S810-763	リード線（桃） Lead wire（Pink） ℓ = 200	1	1B999-072		×	W-0056PK
1S810-764	リード線（黒） Lead wire（Black） ℓ = 100	1	1B999-072		×	W-0056BK
1S810-765	リード線（赤） Lead wire（Red） ℓ = 25	1	1B060-284 1B999-066 1B999-072		×	W-0056RE

(5) Shutter/Film-advance mechanism unit/Motor rotation mechanism unit



部 品 表 Parts list

FAA 20051 — R. 3176. A

部品番号 Part No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Subassembly No.	参照図番 Reference Fig. No.	販売区分 Term of Sale	備考 Remarks
1S810-766	リード線（緑） Lead wire（Green） $\ell = 20$	1	1B060-284 1B990-066 1B999-072		×	W-0056GN
1S810-767	リード線（橙） Lead wire（Orange） $\ell = 35$	1	1B060-284 1B990-066 1B999-072		×	W-0056OR
1S810-768	リード線（白） Lead wire（White） $\ell = 25$	1	1B060-284 1B990-066 1B999-072		×	W-0056WH
1S810-769	リード線（緑） Lead wire（Green） $\ell = 15$	1	1S007-080		×	W-0056GN

部組品一覧表　Assembly List

FAA 20051 — R. 3176. A

部組品番号 Assembly No.	名称 Name	1台分個数 Pcs.per Unit	大部組品番号 Main Assembly No.	参照図番 Figure	備考 Remarks	
*1B001-085	吊り環 Eyelet	2	1B999-072	4	F-301	10
*1B001-572-1 (1B001-572)	絞り制御Mg基板 Base plate, aperture control magnet	1	1B990-046-2 1B999-072	6	F-301	1
*1B001-602-7	裏蓋 Camer back	1		14	F 301	1
1B001-642-3	着脱連動レバー基板 Base plate, lens release lever	1	1B999-072	5		5
*1B001-645	減速基板 Base plate, motor rotation reducing	1	1B990-067	2	F-301	1
1B060-282-3	EE識別SW EE lens swtch	1	1B999-072	5		5
1B060-283	AFモーター AF motor	1	1B990-066 1B999-072	5		1
1B060-284	フォトインターラプター保持基板 Base plate, photo interrupter	1	1B990-066 1B999-072	5		1
1B060-285	fo基板 fo base plate	1	1B999-072	4		5
*1B201-023-1 (1B201-023)	巻戻しクランク Rewind crank	1	1B990-052	11	F-301	5
*1B240-034	板バネ Leaf spring	1	1B999-072	7	F-301	5
*1B260-028-1 (1B260-028)	モーターギャ組 Gear unit, motor	1	1B990-067	2	F-301	1
*1B260-029	基準軸 Reference shaft	1	1B990-067	2	F-301	5

要求単位

部組品一覧表　Assembly List

FAA 20051 — R. 3176. A

部組品番号 Assembly No.	名称 Name	1台分個数 Pcs.per Unit	大部組品番号 Main Assembly No.	参照図番 Figure	備考 Remarks	
*1B260-031-1 (1B260-031)	セグメントギヤ Segment gear	1	1B990-046-2 1B999-072	6	F-301	5
*1B277-005	絞り制御ギヤ Aperture control gear	1	1B990-046-2 1B999-072	6	F-301	5
*1B277-012	ラチェットギヤ Ratchet gear	1	1B990-046-2 1B999-072	6	F-301	5
*1B310-042-2 (1B310-042-1)	横軸連結レバー Side shaft coupling lever	1	1B999-072	7	F-301	5
*1B314-122	ミラー駆動レバー Mirror actuating lever	1	1B990-035-1	3	F-301	5
*1B314-131	Sチャージレバー Shutter charge lever	1	1B001-645	2	F-301	5
1B370-013	基準軸円盤 Disk, reference shaft	1		3	F-301	5
*1B600-013-1	圧板 Pressure plate	1		14	F-301	5
1B610-035-1	AF接点 AF contact	1	1B999-072	5		5
1B610-040	カップリング軸受け基板 Base plate, coupling bearing	1	1B999-072	5		5
*1B630-032	リモートコネクター Remote connector	1	1B999-072	4	F-301	5
*1B640-029-1	ISOダイヤル ISO film speed dial	1		11	F-301	5
1B640-031	Tブラシ環 Ring, shutter dial brush	1	1B990-062-2	10		5

部組品一覧表　Assembly List

FAA 20051 — R. 3176. A

部組品番号 Assembly No.	名称 Name	1台分個数 Pcs.per Unit	大部組品番号 Main Assembly No.	参照図番 Figure	備考 Remarks	
1B640-032	ISO ブラシ Brush, ISO film speed	1		11		5
1B640-037	連動環 Aperture coupling ring	1	1B999-072	4		5
* 1B670-064-5 * 1B670-064-6	電池室 Battery chamber	1		13	OLD F-301	5
* 1B680-036	シュー座 Accessory shoe	1	1B990-028-3	12	F-301	5
1B680-038-1	ミラーBox 底板 Bottom plate, mirror box	1		7		5
1B990-028-3	上カバー Top cover	1		12		1
* 1B990-029-2	底カバー Bottom cover	1			F-301	1
* 1B990-035-1	下地基板 Unit, film-advance mechanism	1		3	F-301	1
* 1B990-036-2	上地基板 Unit, film- advance	1	1B990-062-2	10	F-301	1
* 1B990-037-1 (1B990-037)	電源SW Power switch	1	1B990-062-2	10	F-301	5
* 1B990-038-3 (1B990-038-2)	フィルムガイド Unit, film arm	1		1	F-301	5
* 1B990-039	電池ホルダー Battery holder	1			F-301	5
1B990-041-2	I 基板 Base plate I	1	1B999-072	7		1

部組品一覧表　Assembly List

FAA 20051 — R. 3176. A

部組品番号 Assembly No.	名称 Name	1台分個数 Pcs.per Unit	大部組品番号 Main Assembly No.	参照図番 Figure	備考 Remarks	
1B990-046-2	L基板 Base plate L	1	1B999-072	6		1
* 1B990-050-1	ISOロック釦 Button, ISO dial lock	1		11	F-301	5
* 1B990-051-1	巻戻し軸受 Rewind shaft bearing	1		11	F-301	5
* 1B990-052	巻戻しノブ Rewind knob	1		11	F-301	5
1B990-059-2	主ミラー Main mirror	1	1B999-072	7		1
1B990-062-2	電源FPC Power sw FPC	1		10		1
1B990-064	カップリング軸 Axle, AF coupling	1	1B999-072	5		5
1B990-065	カップリング解除レバー Release lever, AF coupling	1	1B999-072	5		5
1B990-066	AF駆動部 Unit, AF motor	1	1B999-072	5		1
1B990-067	M減速基板 Unit, motor rotation reducing	1		2		1
1B990-068	DX接点 DX contact	1		1		5
1B999-071	モーター基板部 Base plate, AF motor	1	1B990-066 1B999-072	5		5
1B999-072	前板 Front plate	1		4, 5 6, 7, 8 10		1
1B999-065	シャッター組 Shutter unit	1		1		1

部組品一覧表　Assembly List

FAA20051 — R.3176.A

部組品番号 Assembly No.	名称 Name	1台分個数 Pcs.per Unit	大部組品番号 Main Assembly No.	参照図番 Figure	備考 Remarks	
(FAA20151) 1B999-074	上カバー Top cover	1			カナダ用 U.S.A. For Canada U.S.A.	1
1B999-077	単三用底カバー Bottom cover	1		13		1
1B999-078-1	バッテリーホルダー Battery holder	1		13		1
1S007-080-1	メインFPC Main FPC	1		9		1
1S007-082-2	AF FPC	1		9.6		1
* 1S007-086	P. SW. P Base plate. program switch	1	1B999-072	6	F-301	5
1S007-087	fmm 基板 fmm base plate	1	1B999-072 1B990-046-2	6		1
1S045-050	f-fo 基板 f-fo base plate	1	1B999-072	4		1
1S050-006	DC-DC コンバーター DC- DC converter	1		10		1

(6) Apron/f-fo base plate

Bayonet screw #473 Fig.4

⊕ Screw #473x4
⊕ Screw #475x1
Bayonet ring #471
Bayonet spring #472
EE lens pin #501
EE lens pin spring #502
E-ring, EE lens pin #755

S/C lever plate #949 Fig.4

⊖ Screw #951
S/C lever #948

Apron #22 Fig.4

Unfasten ⊕ Screw #945
⊕ Screw #836
Aperture coupling ring B482
Aperture coupling ring
Spring roller #485
AEL button #451
AFL button #452

Unsolder lead wires from f-fo base plate — Wiring diagram

1 Lead wire #1157 (orange)
2 Lead wire #1158 (blue)
3 Lead wire #1156 (brown)

f-fo base plate B1131 Fig.4

⊕ Screw #802x2

(7) AF motor unit

Unsolder lead wires from power switch FPC — Wiring diagram

1 Photo interrupter lead wire #1181 (red)
2 -ditto- #1182 (green)
3 -ditto- #1183 (orange)
4 -ditto- #1184 (white)
5 Lens contact FPC lead wire #1168 (orange)
6 -ditto- #1169 (black)
7 AF motor lead wire (red)
8 -ditto- (blue)

AF motor unit B2901 Fig.5

⊕ Screw #712x2
⊖ Screw #715x1

(8) AF FPC

Press-contact of AF FPC Fig.9

⊕ Screw #668x2
Press-contact plate #673
Press-contact rubber #674

Remove adhesive at mirror box bottom plate Fig.7

AF FPC B1004

⊖ Screw #405x3
Spring #406x3
⊕ Screw #820x2

(9) Pentaprism

Press-contact of main FPC and power switch FPC — Fig.9

Press-contact plate #662
Press-contact rubber B #664
⊕ Screw #860x2

Unsolder lead wires from main FPC — Wiring diagram

1 Mirror sw lead wire #1177 (pink)
2 f-fo lead wire #1157 (orange)
3 Shutter lead wire (ATO) #1145 (yellow)
4 -ditto- (GND) #1142 (black)
5 -ditto- (IS) #1146 (purple)
6 -ditto- (1st Mg) #1143 (gray)
7 -ditto- (V BAT) #1141 (red)
8 -ditto- (2nd Mg) #1144 (green)

Unsolder nine lead wires from lens contact FPC — Wiring diagram

Unsolder six lead wires from AF LED — Wiring diagram

AE SPD base plate retaining spring #436 — Fig.8

⊕ Screw #710x2

Pentaprism retainer #426 — Fig.7

* Lift main FPC up.

Pentaprism G4 — Fig.8

Pentaprism spring #427

(10) Mirror box/Aperture magnet

Take off fo spring #495

Unscrew mirror box screws — Fig.7

⊕ Screw #839x2
⊕ Screw #809
⊕ Screw #388
Mirror actuating lever holding plate #321

Mirror holder B331 — Fig.7

Mirror down spring #410
Washer #761

Aperture control lever #327 — Fig.7

E ring #754

Unscrew screws of base plate I — Fig.7

⊕ Screw #813
⊕ Screw #851
Mirror switch B319

Base plate L B341 — Fig.7

Program switch base plate B1136 — Fig.6

⊕ Screw #382
⊕ Screw #387

Aperture magnet #355 — Fig.6

⊕ Screw #851x2

(11) Main FPC

Press-contact of main FPC and power switch FPC — Fig.9

⊕ Screw #860x2
Press-contact plate #662
Press-contact rubber B #664

Unsolder lead wires from main FPC — Wiring diagram

1 Mirror sw lead wire #1177 (pink)
2 -ditto- #1178 (black)
3 Program sw lead wire #1170 (orange)
4 Aperture magnet lead wire (blue)
5 -ditto- (red)
6 EE lens sw lead wire #1153 (blue)
7 f-fo base plate lead wire #1157 (orange)
8 -ditto- #1158 (blue)
9 -ditto- #1156 (brown)
10 fo base plate lead wire #1161 (blue)
11 -ditto- #1159 (white)
12 -ditto- #1160 (orange)
13 TTL SPD lead wire #1172 (yellow)
14 -ditto- #1171 (brown)
15 Fmm sw lead wire #1173 (green)
16 -ditto- #1174 (white)
17 One shot sw lead wire #1152 (purple)
18 AF A/M changeover sw lead wire #1154 (white)
19 Pentaprism retaining plate #426

Unsolder nine lead wires from lens contact FPC — Wiring diagram

Unsolder six lead wires from AF LED — Wiring diagram

AE SPD base plate retaining spring #436 — Fig.8

⊕ Screw #710x2

Unsolder lead wires from remote terminal — Wiring diagram

1

1

Press-contact AF FPC — Fig.9

⊕ Screw #668x2
AF FPC press-contact rubber #764
AF FPC press-contact plate #673

Unscrew main FPC screws of rewind side — Fig.9

⊕ Screw #820x1
⊕ Screw #839x2

Press-contact of AE LED — Fig.9

AE LED press-contact spring #686
AE LED press-contact mold #684
AE LED press-contact rubber #685

Mian FPC B1001 — Fig.9

(9) Power switch FPC/DC/DC converter

Press-contacts of main FPC and power switch FPC | Fig.9

⊕ Screw #860x2
Press-contact plate #662
Press-contact rubber B #664

Unsolder five contacts of DC/DC converter | Wiring diagram

Unsolder lead wires | Wiring diagram

1 Photo interrupter lead wire #1181 (red)
2 -ditto- #1182 (green)
3 -ditto- #1183 (orange)
4 -ditto- #1184 (white)
5 Lens contact FPC lead wire #1168 (orange)
6 -ditto- #1169 (black)
7 AF motor lead wire (red)
8 -ditto- (blue)

Unscrew power switch FPC screws | Fig.10

⊕ Screw #820x3

Power switch FPC B4002 | Fig.10

DC/DC converter B1021 | Fig.10

⊕ Screw #839x2

1．ボディ、シャッター部 BODY·DICASTING, SHUTTER UNIT

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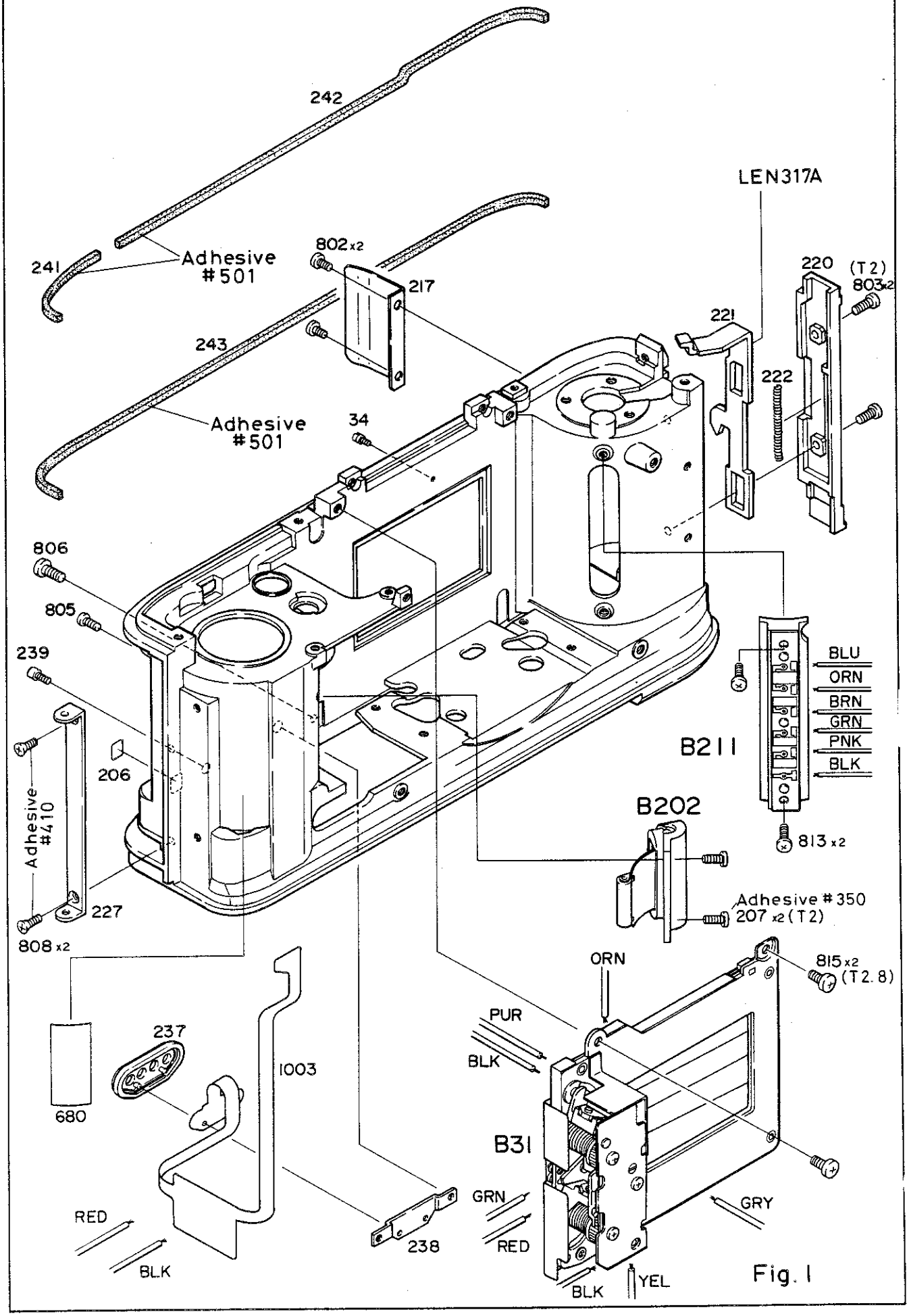


Fig. 1

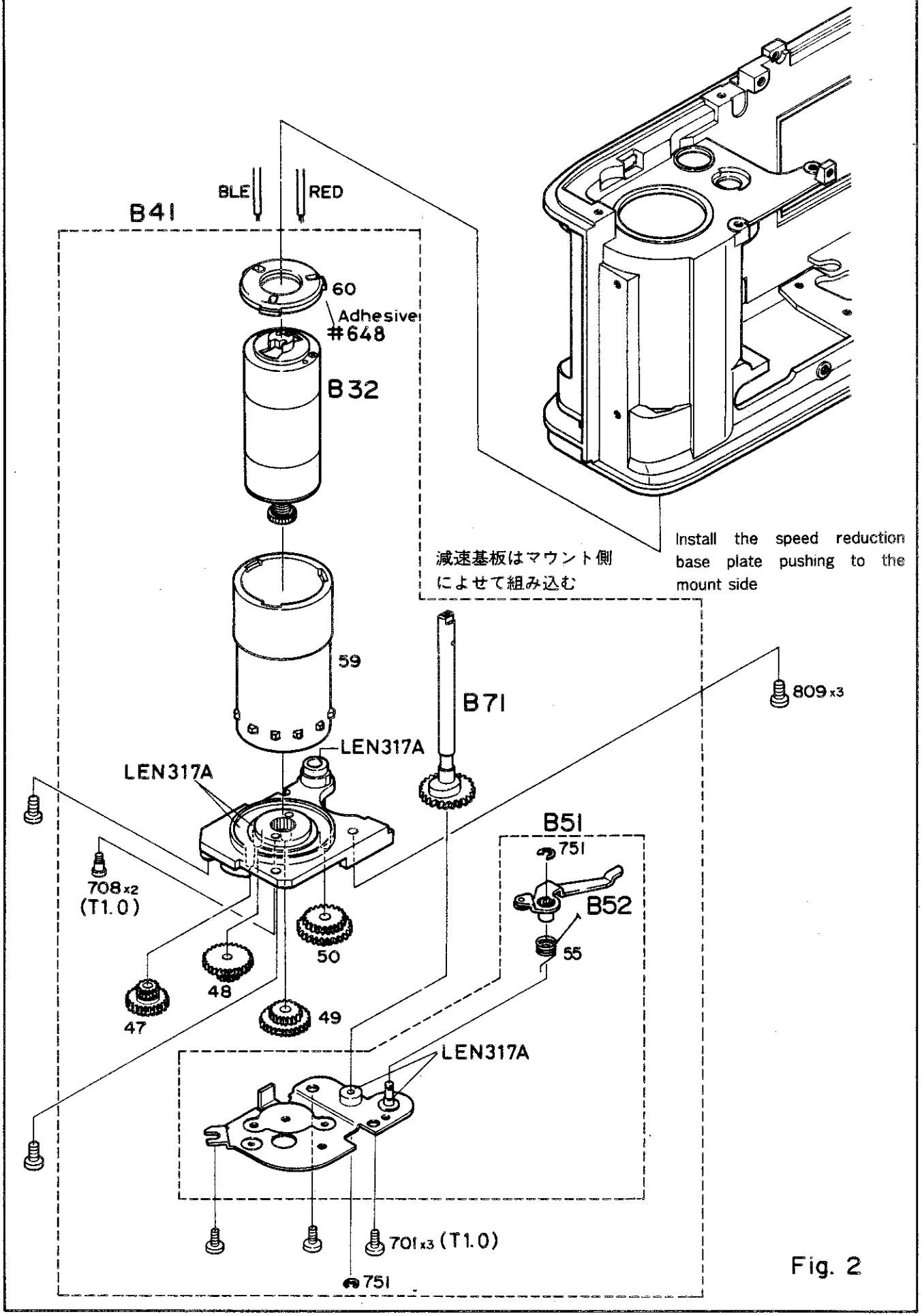

BLE
RED
B41
60
Adhesive
#648
B32
減速基板はマウント側
によせて組み込む
Install the speed reduction base plate pushing to the mount side
59
B71
809 x3
LEN317A
LEN317A
B51
751
B52
708 x2
(T1.0)
50
55
48
47
49
LEN317A
701 x3 (T1.0)
751

Fig. 2

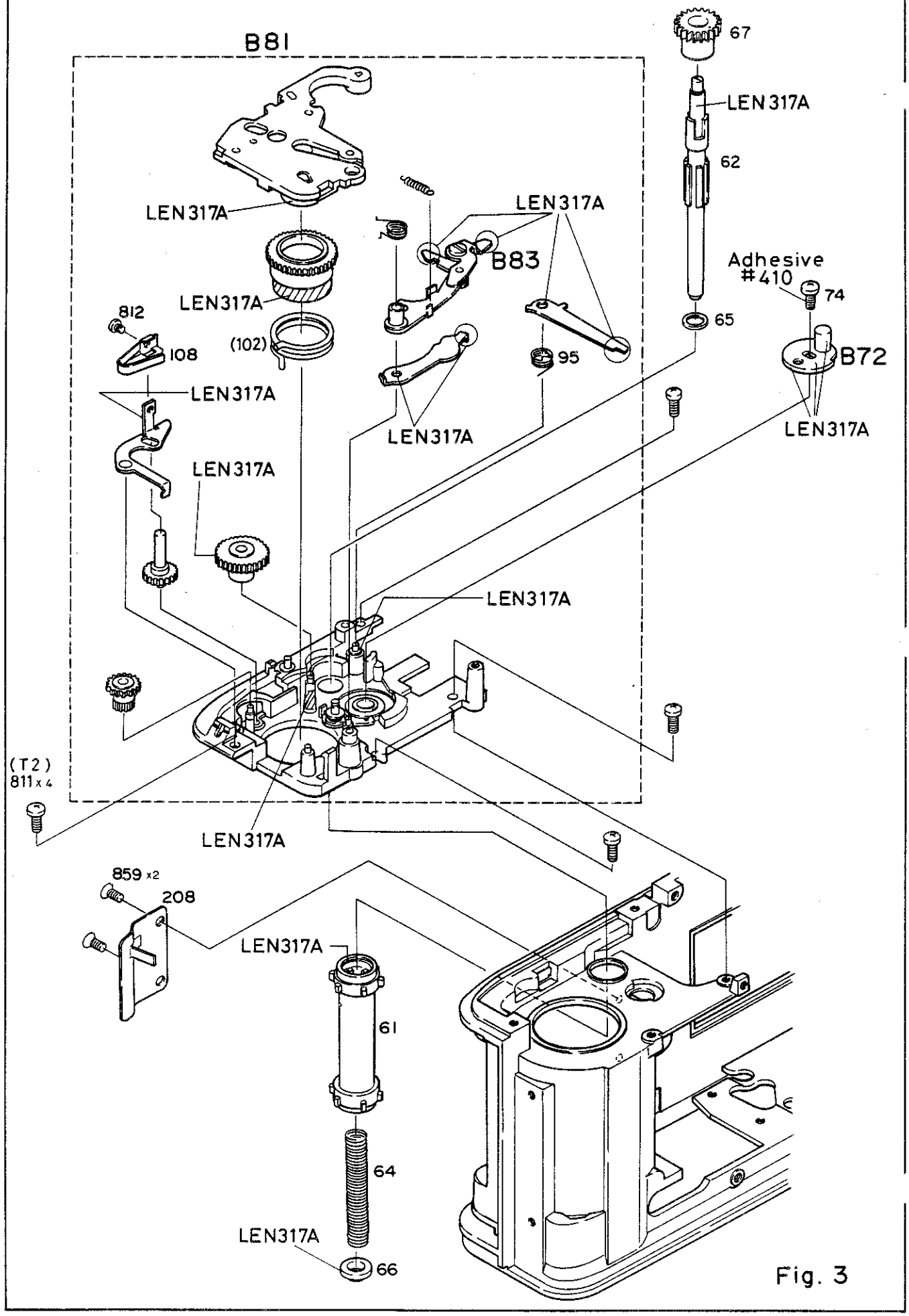
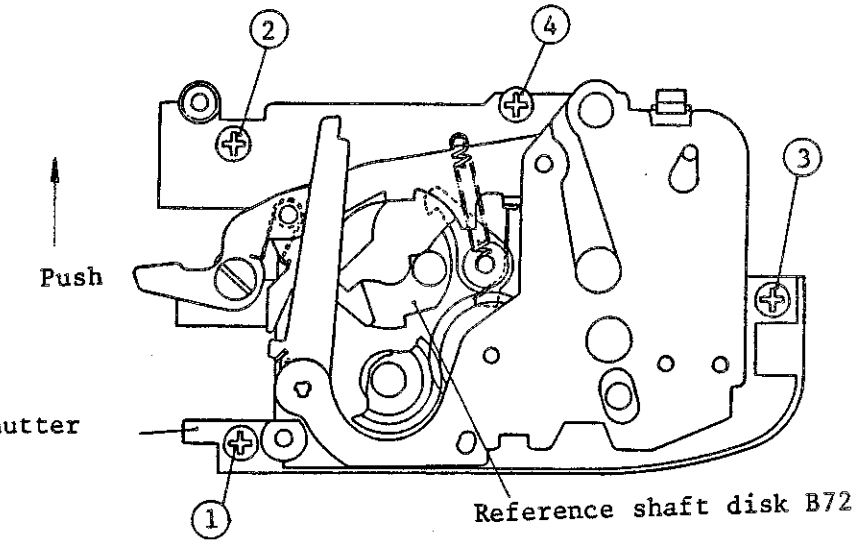

B81
67
LEN317A
62
LEN317A
LEN317A
B83
Adhesive
#410
74
812
LEN317A
(102)
65
108
95
B72
LEN317A
LEN317A
LEN317A
LEN317A
(T2)
811x4
LEN317A
859 x2
208
LEN317A
61
64
LEN317A
66

Fig. 3

fig. 3 How to install the film-advance mechanism unit and the reference shaft disk

After installing the film-advance mechanism unit, rotate the spool and fix the spool fliction spring to the spool. Then, tighten the screw #811.

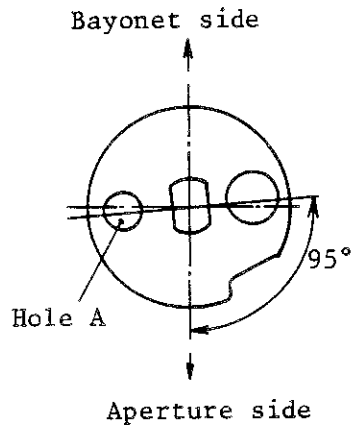


Push the film-advance mechanism unit to the mount side and tighten the screws in the order indicated in fig. 3-1.

Rotate the reference shaft B71 with the manual film-advance tool (J15258). When the charge lever B52 comes to the aperture side, set the reference shaft. (fig. 3-2)

Set the reference shaft and reference shaft disk at the position indicated in fig. 3-2

Apply the adhesive #410B/M to the point of the screw #74. Fixed the hole A with the driver and tighten the screw #74.



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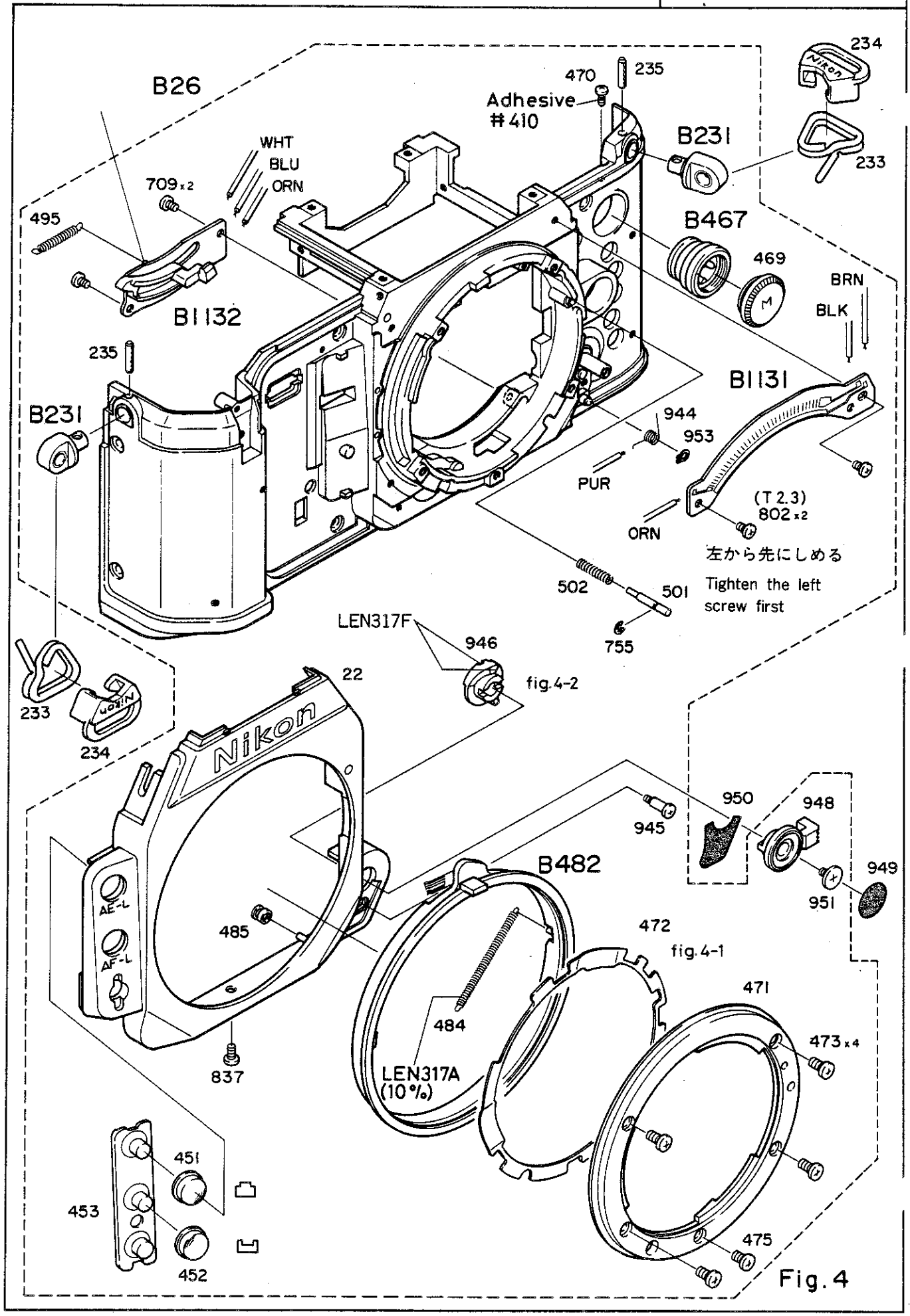


fig. 4-1 Bayonet spring-lubrication

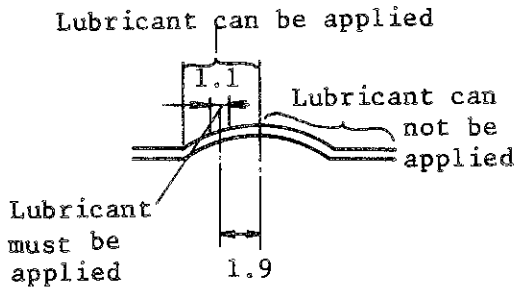
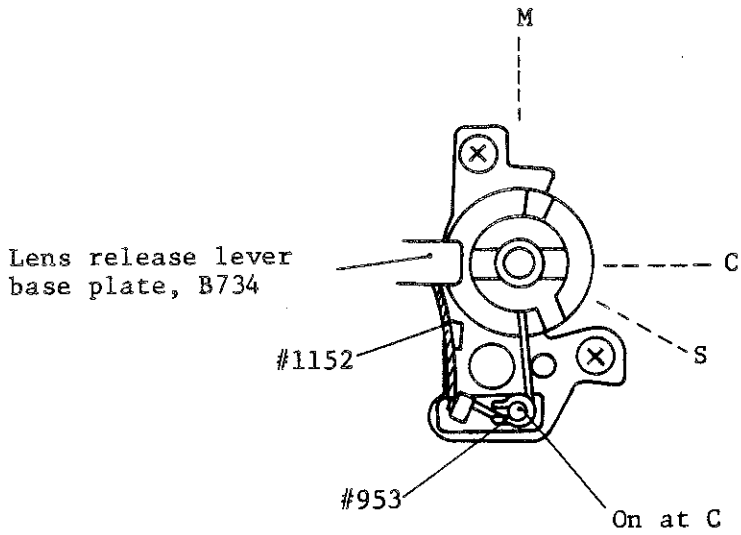
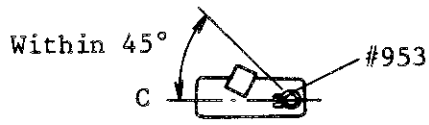


fig. 4-2 S/C exchangeing cam





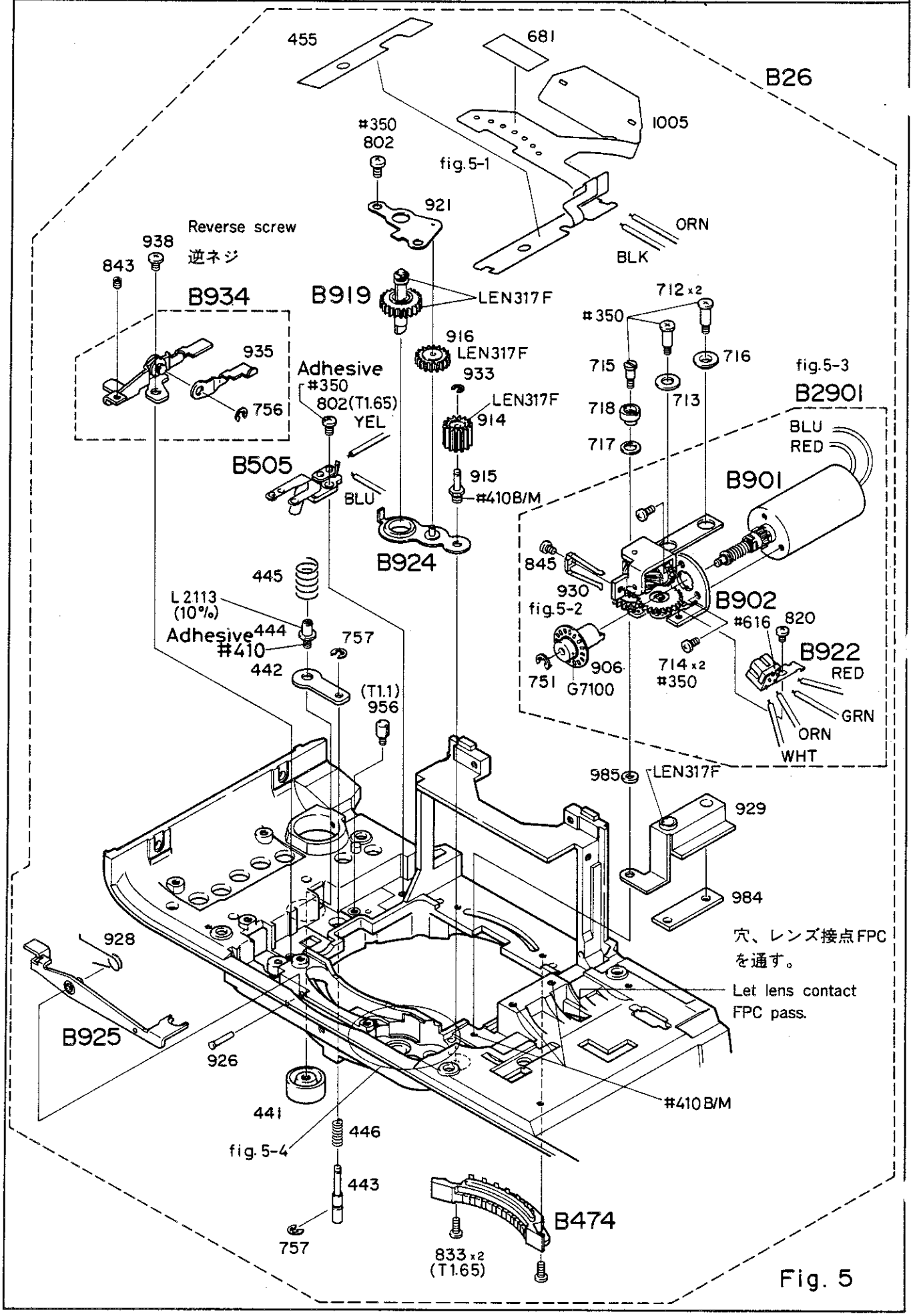

455
681
B26
#350
802
1005
fig.5-1
921
ORN
BLK
Reverse screw
逆ネジ
938
843
B934
B919
LEN317F
712×2
#350
916
LEN317F
935
Adhesive
#350
802(T1.65)
YEL
933
715
716
fig.5-3
B2901
LEN317F
914
718
713
BLU
RED
717
B505
915
#410B/M
B901
BLU
B924
845
930
fig.5-2
B902
445
L2113
(10%)
Adhesive
#410
444
757
442
#616
820
B922
RED
906
G7100
751
714×2
#350
(T1.1)
956
GRN
ORN
WHT
985
LEN317F
929
984
928
穴、レンズ接点FPC
を通す。
Let lens contact
FPC pass.
B925
926
#410B/M
441
446
fig.5-4
443
757
B474
833×2
(T1.65)

Fig. 5

fig. 5-1 Soldering of the lens contact FPC (1005) with the lens contact B474

Solder should not be over the lens contact

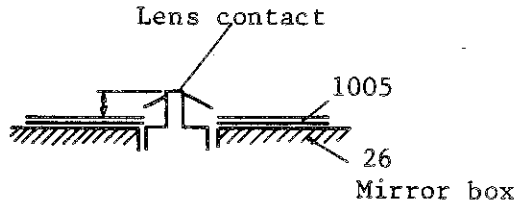


fig. 5-2 Installation of the photo interrupter

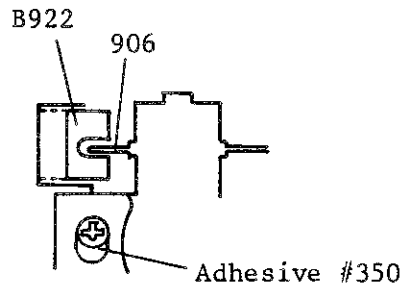


fig. 5-3 Positioning of the AF motor

After installing the AF motor unit B2901 to the camera, set the codes as indicated in the right figure.

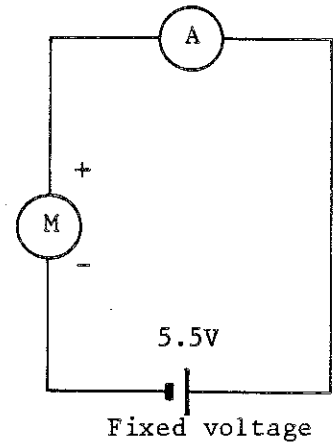
① Turn #715 so that the current value will be be maximum.

② Turn the collar #718 in the reverse direction to ① so that the current value will be minimum.

③ Then, turn #718 in the reverse direction to ② so that the current value starts to rise.

④ Return #718 in 30° from the position set in ③

⑤ Apply adhesive on the tops of #712x2 and #718.



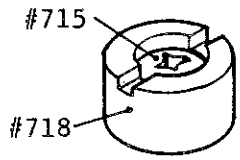
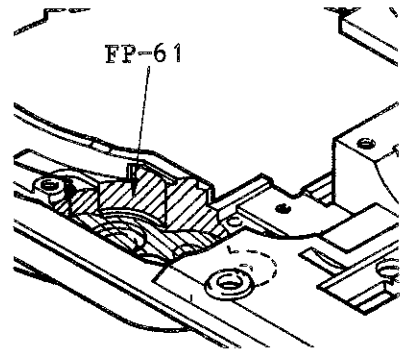


fig. 5-4 Application of the oil barrier

Apply the oil barrier to prevent the bleeding of the oil.



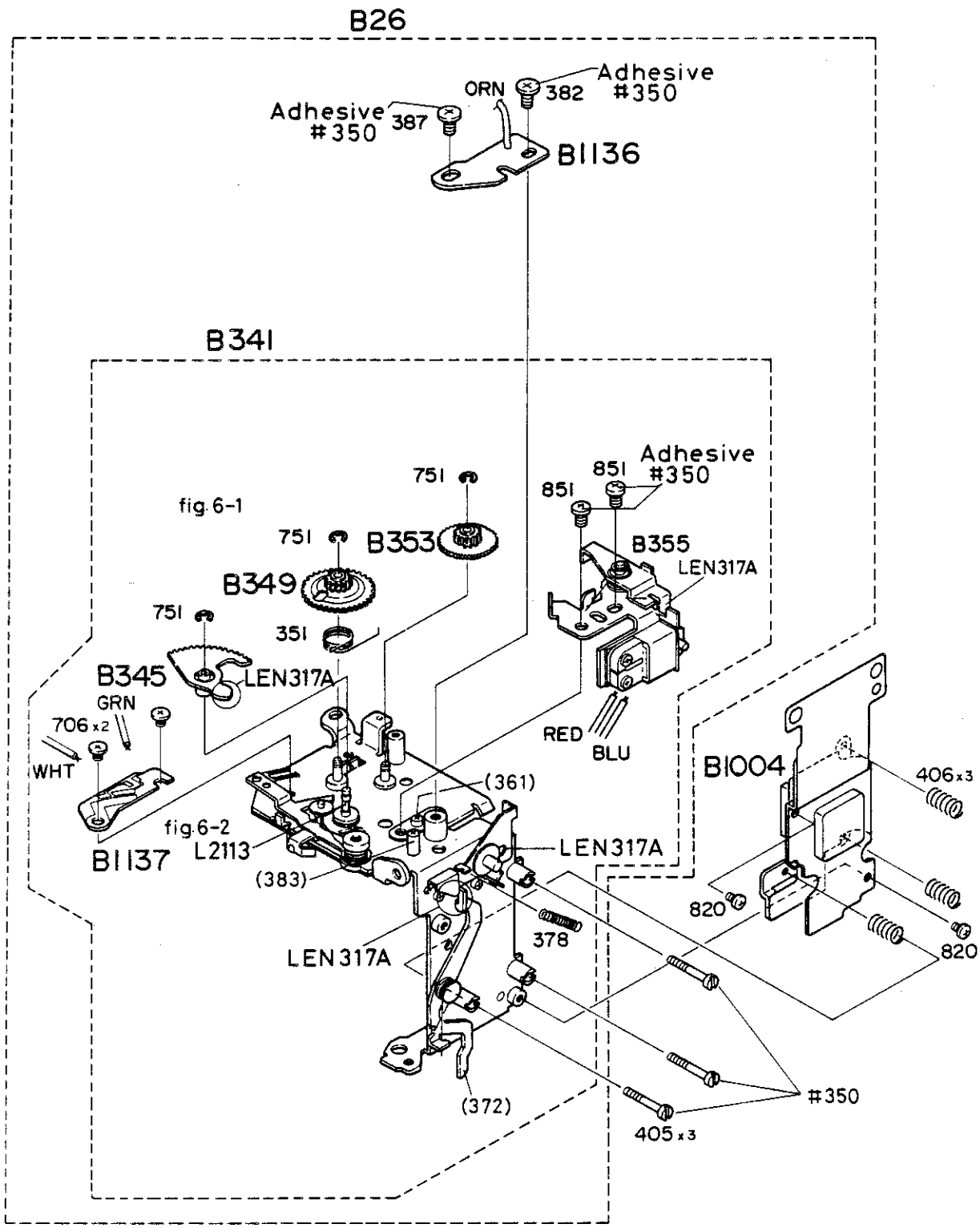

B26
Adhesive #350
ORN
382
Adhesive #350
387
B1136
B341
751
851
Adhesive #350
851
fig.6-1
751
B353
B355
LEN317A
B349
751
351
B345
LEN317A
GRN
706 x2
WHT
RED
BLU
B1004
406 x3
(361)
fig.6-2
L2113
LEN317A
B1137
(383)
820
378
820
LEN317A
#350
(372)
405 x3

Fig. 6

fig. 6-1

Rotate the aperture control gear B349. Clockwise and keep it at the position where spring hole is facing to the center of #353. Then, install the segment gear B345.

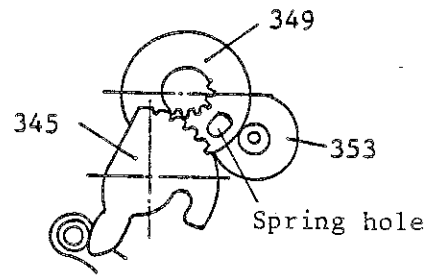


fig. 6-2 Positioning of the fmm switch

Loosen the screw #706 and adjust the fmm position.

- With the lens whose focal length is shorter than 135mm: white - off
  green - off
- With the lens whose focal length is 135mm or longer: white - on
  green - off
- With AI-S teleconverter: white - off
  green - on

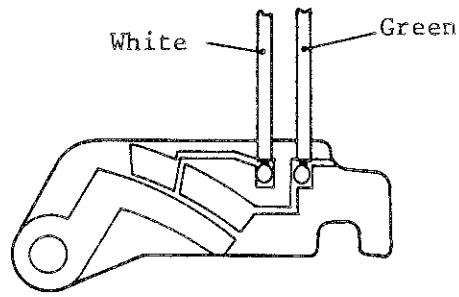


fig. 6-3

1) Connect the program switch lead wires to a tester.
2) Install the mirror box to the front body and set Tool J18004 to the bayonet of camera body.
3) Slowly move the mirror actuating lever #305.
4) Adjust eccentric screw #383 so that the program switch can be turned off when the reading of J18004 is 2.7±0.1.
5) After adjustment, apply on adhesive to both screw heads of screws #387 and #382.

FAA20051-R.3176.A

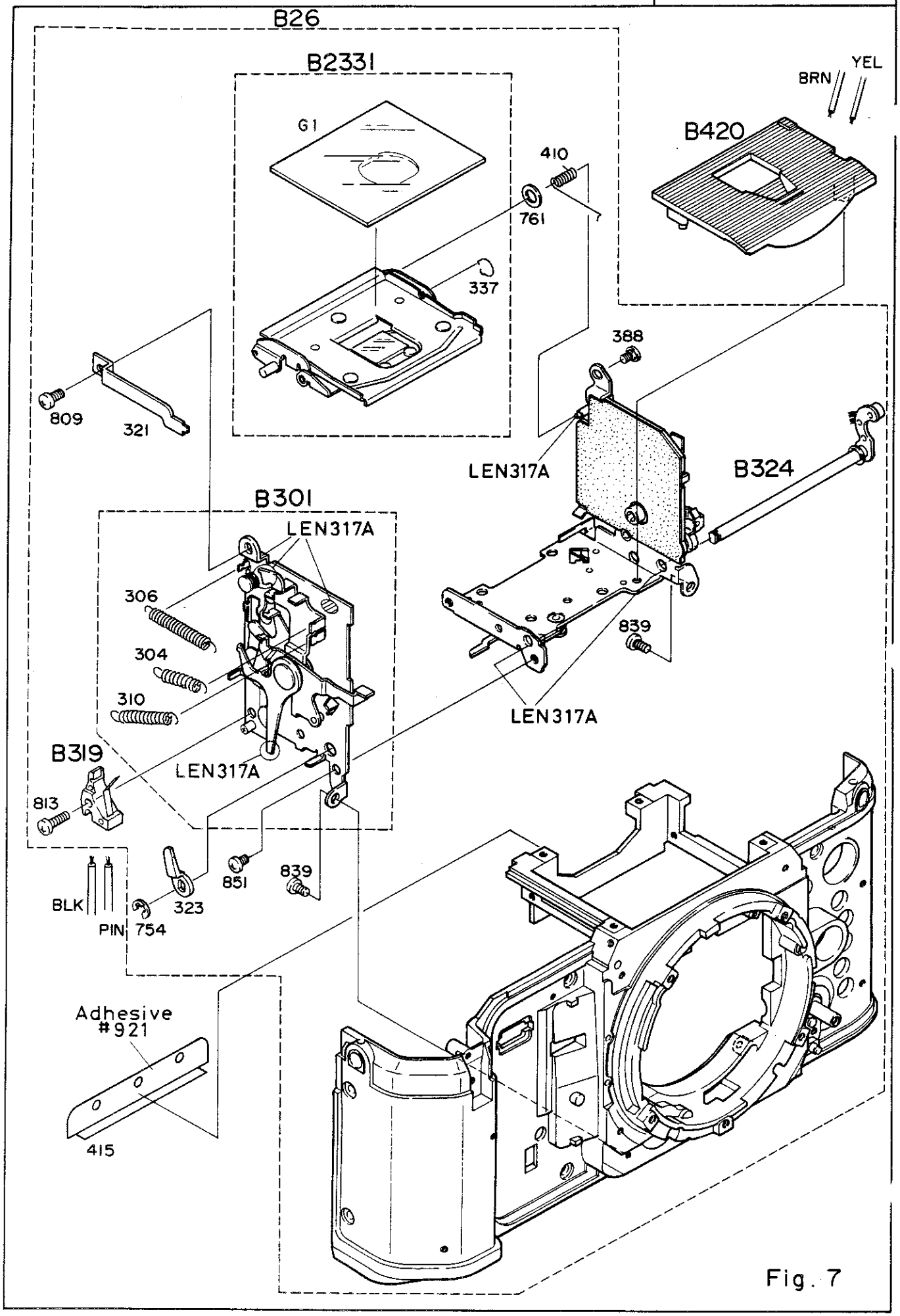


Fig. 7

Adjustment of 45° setting of the reflex mirror

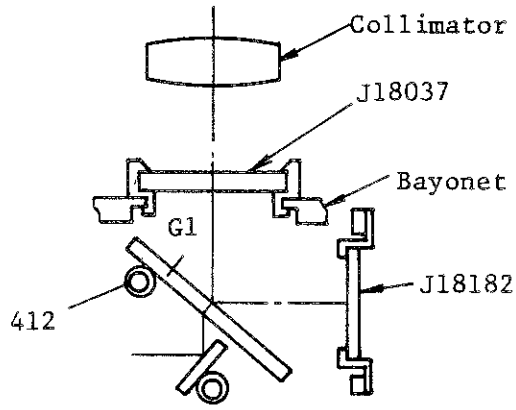
Vertical collimater J19002
Optical lens J18037
Mirror 45° inspecting tool J18182

Set J18037 at the mount

Remove the focusing screen and set J18182.

Turn the switch of the collimator on, Then, turn the mount to the objective lens of the collimator.

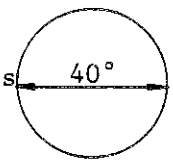
Adjust mirror 45°
① Horizontal: Shift the base plates I and L
② Vartical: Rotate #412.
③ Distortion: Replaster the mirror



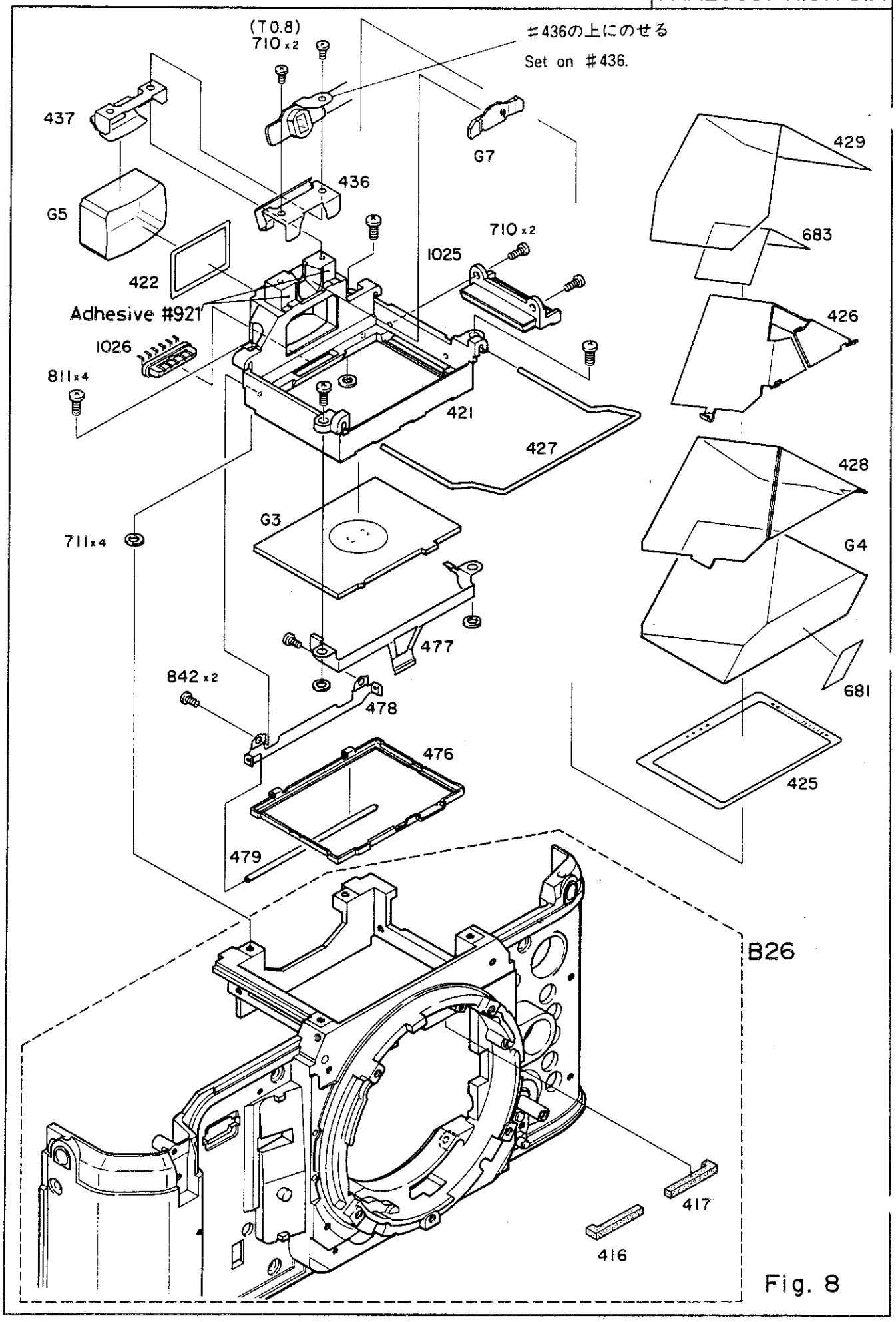
Fixed position of prism box

Standard Horizontal: ±20′
Vertical: ±5′
Distortion: 8′

* Be careful not to touch the sub mirror.

As the field of vision of J19002 is 

, please refer it in the above adjustment.


(T0.8)
710 x2
#436の上にのせる
Set on #436.
437
G7
429
436
G5
710 x2
1025
683
422
Adhesive #921
426
1026
811 x4
421
427
428
711 x4
G3
G4
477
842 x2
681
478
476
425
479
B26
417
416
Fig. 8

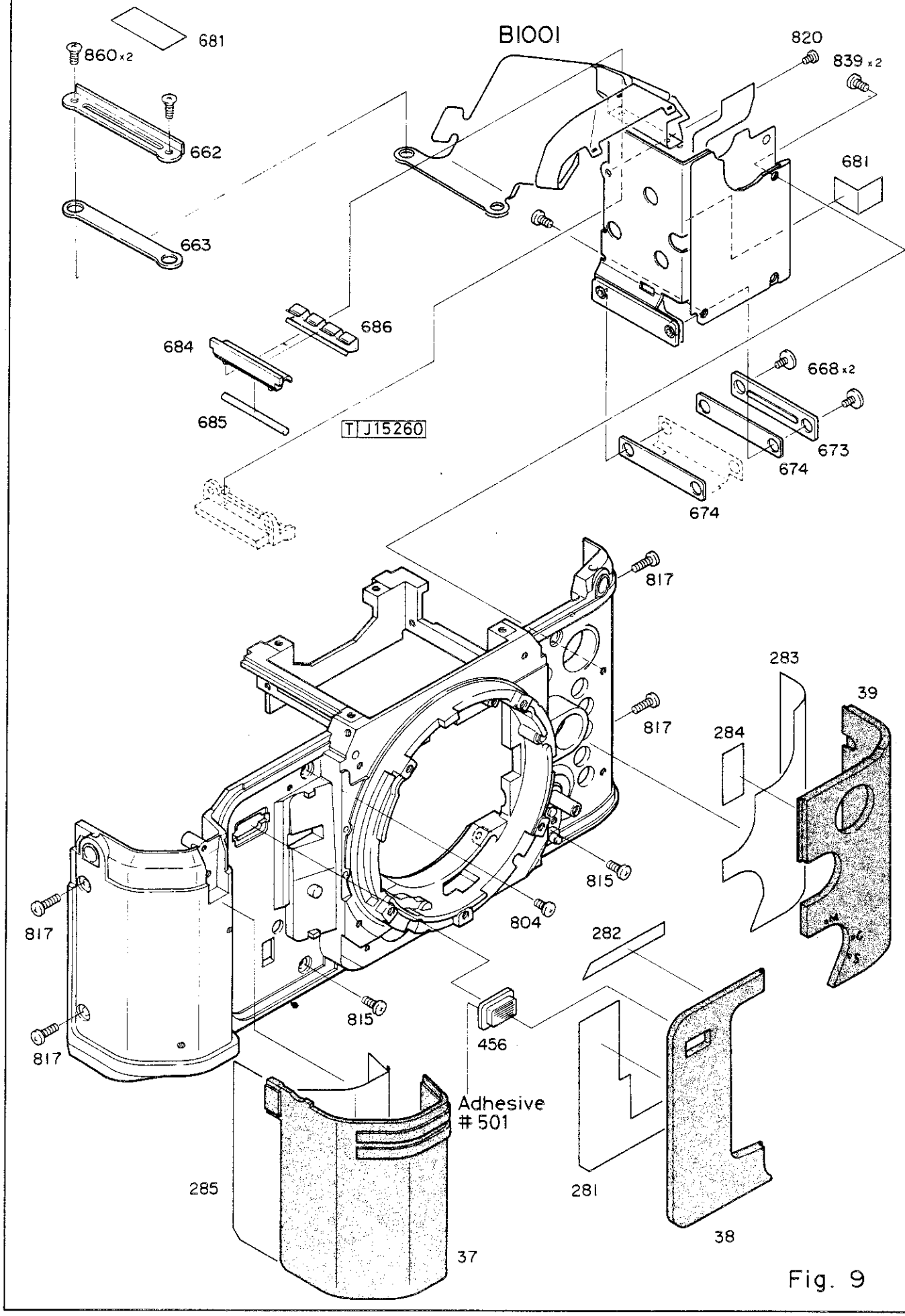

681
860 x2
662
663
B1001
820
839 x2
681
686
684
685
T J15260
668 x2
673
674
674
817
817
283
39
284
815
804
817
815
817
282
456
Adhesive
501
285
281
38
37

Fig. 9

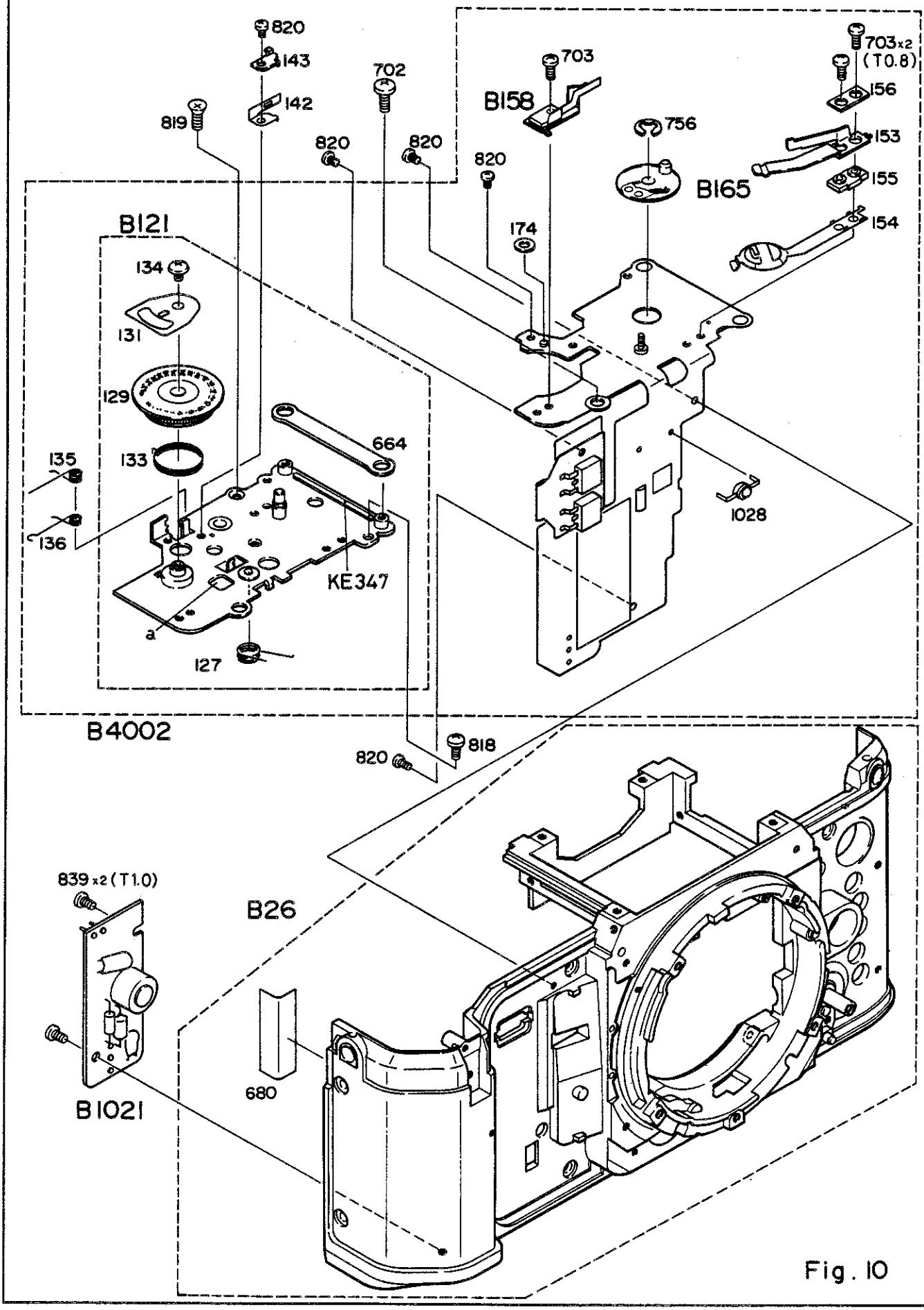

820
143
142
819
702
820
820
820
703
B158
703x2
(T0.8)
156
153
155
154
756
B165
174
B121
134
131
129
133
135
136
664
KE347
a
127
1028
B4002
820
818
839x2 (T1.0)
B26
680
B1021

Fig. 10

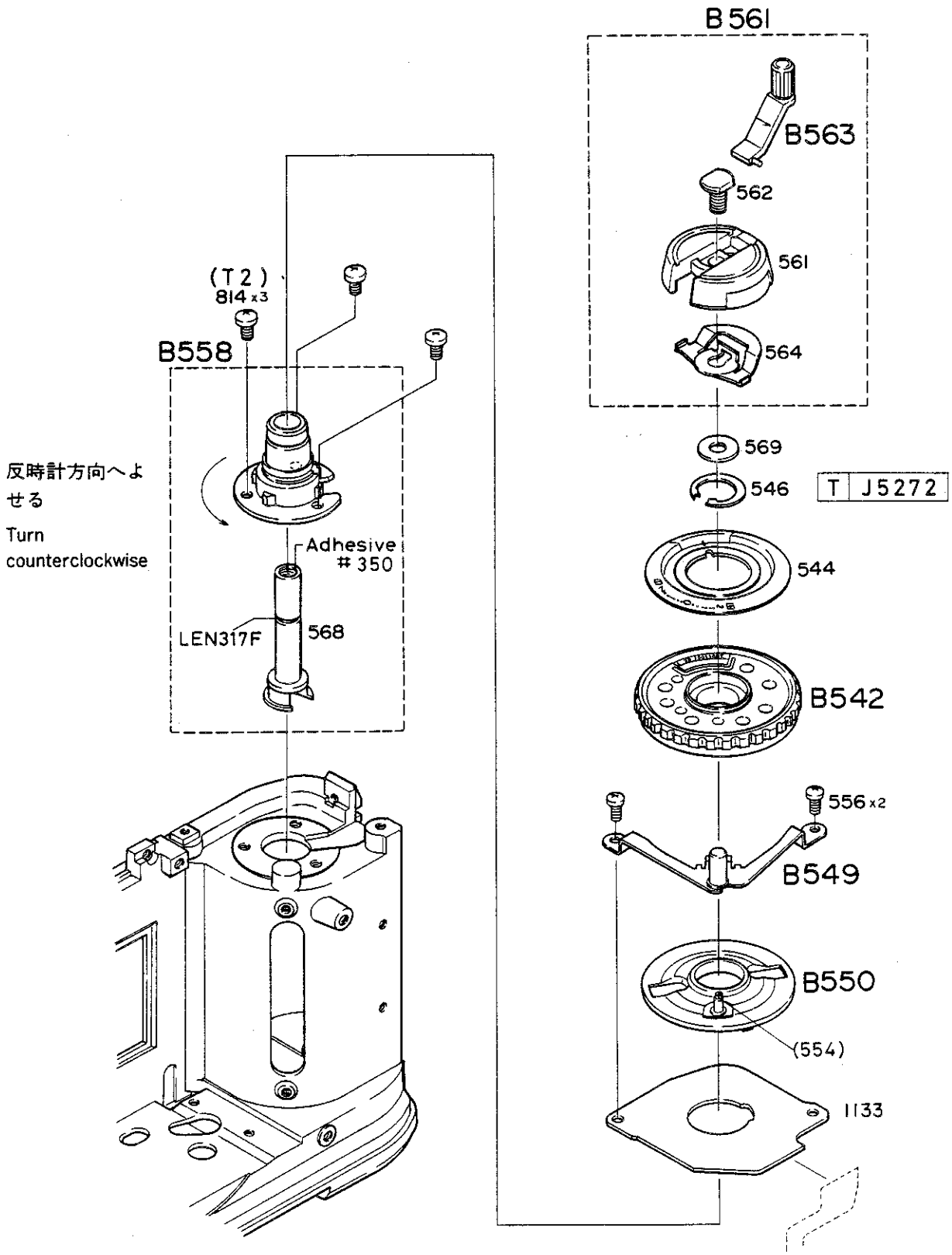

B561
B563
562
561
564
569
546
T J5272
544
B542
556 x2
B549
B550
(554)
1133
(T2)
814 x3
B558
反時計方向へよせる
Turn counterclockwise
Adhesive #350
LEN317F
568

Fig. 11

FAA20051-R.3176.A

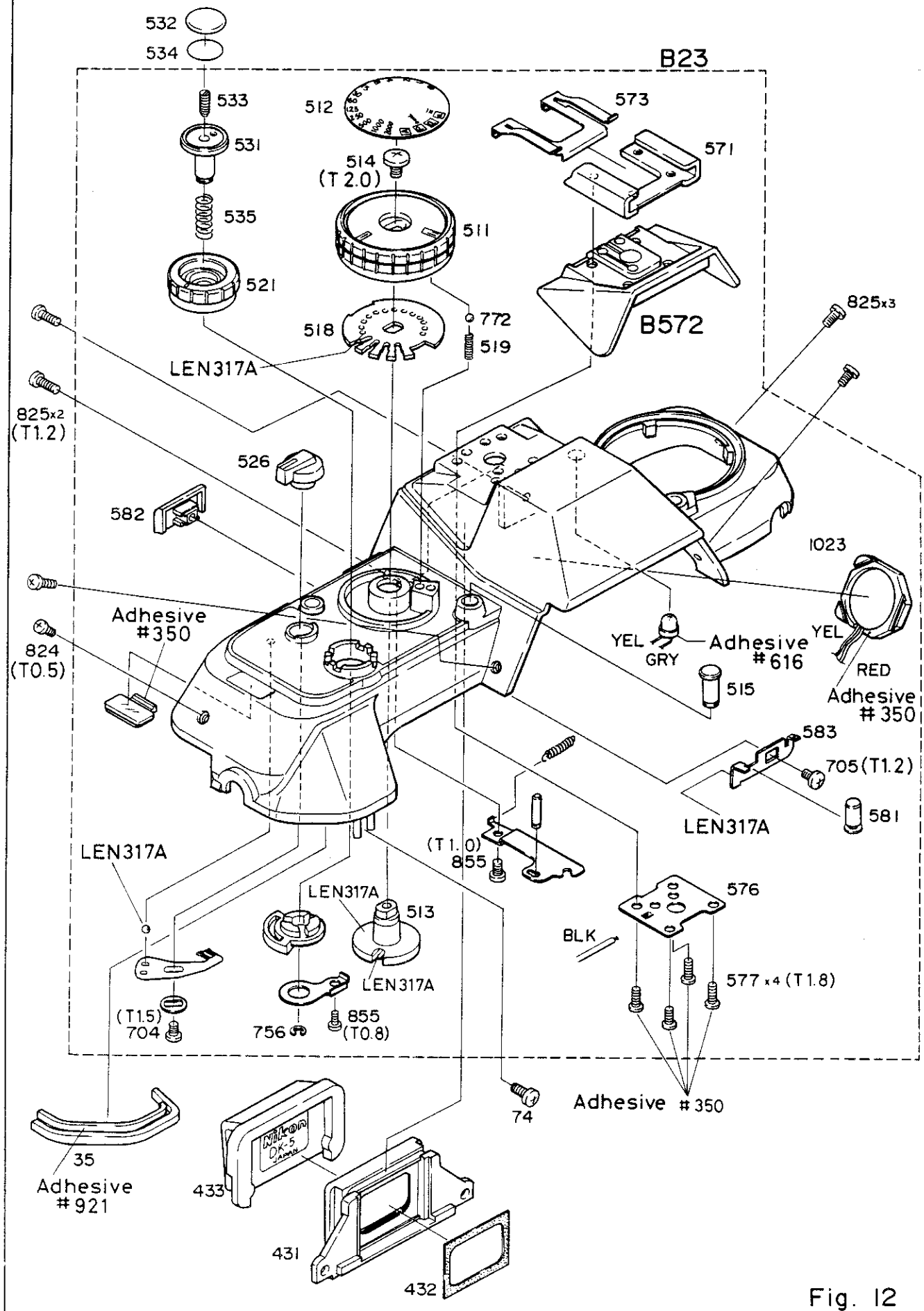


Fig. 12

fig. 12 Installation of the top cover

Solder nine lead wires | Wiring diagram

Stick tapes on #1149 (pink), #1150(brown) and #1151(green) | fig. 12-1

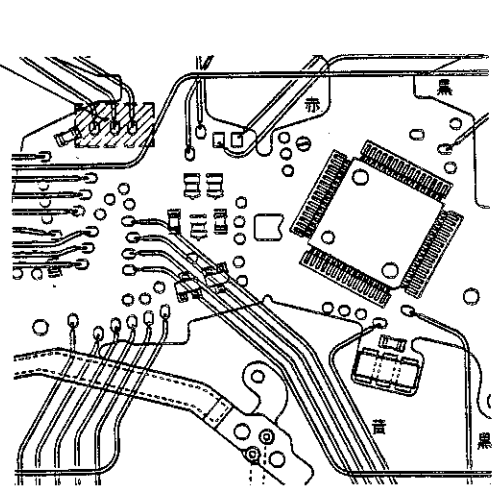
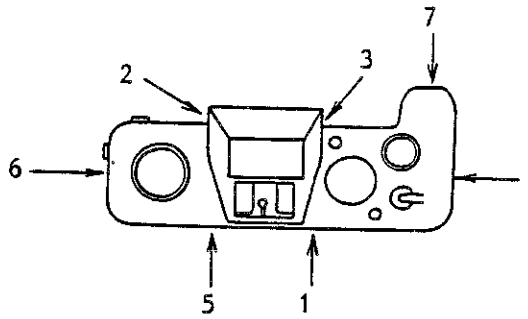


fig. 12-1

① Set the shutter dial to B
② Set the film-advance mode selector to S
③ Turn the shutter dial brush ring B165 (Fig. 10) counterclockwise to the limit.

Do not put the buzzer lead wires(red and yellow) on SPD.

Tighten the screws.



4 * Do not tight excessively, since screw is tightened to the plastic.

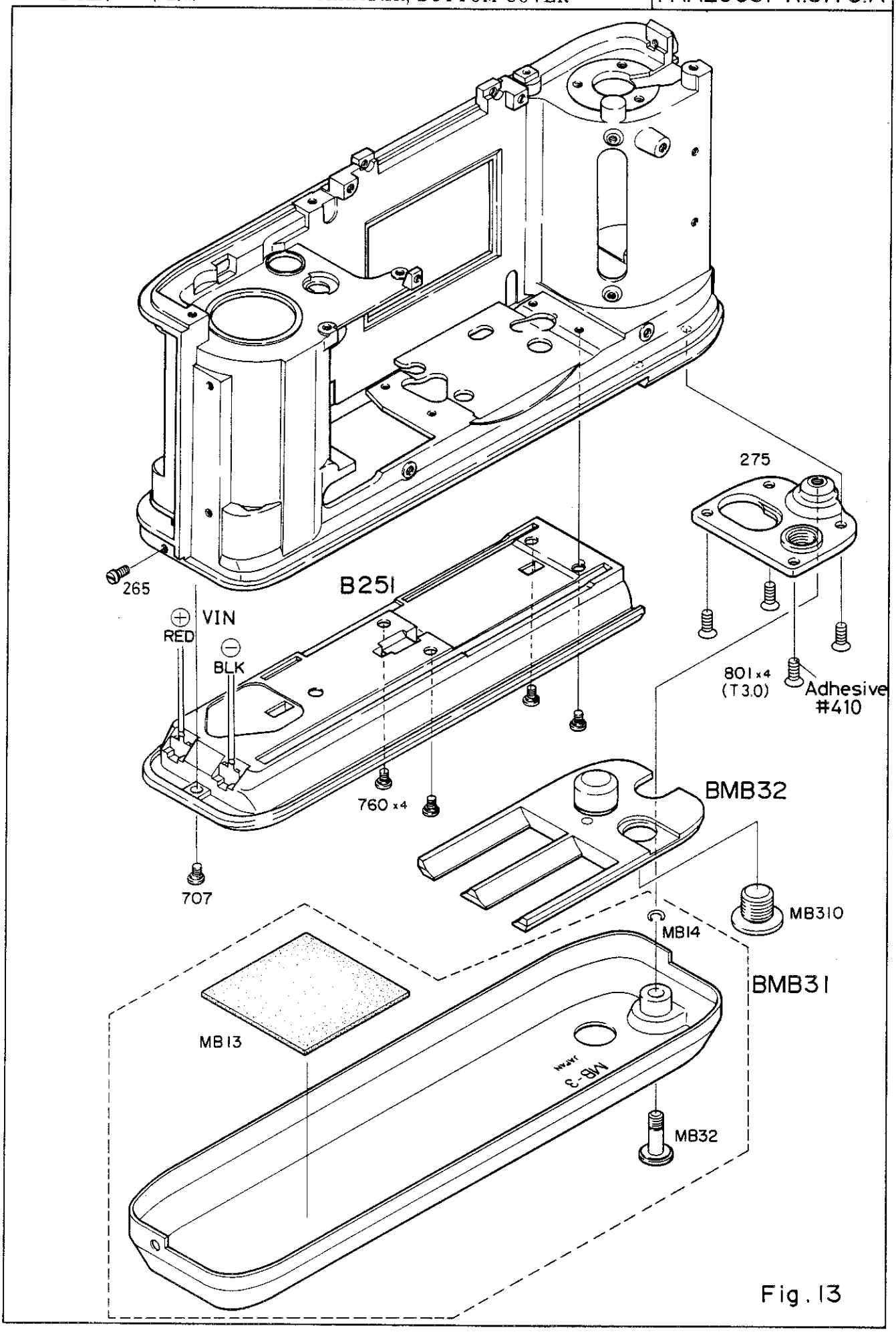
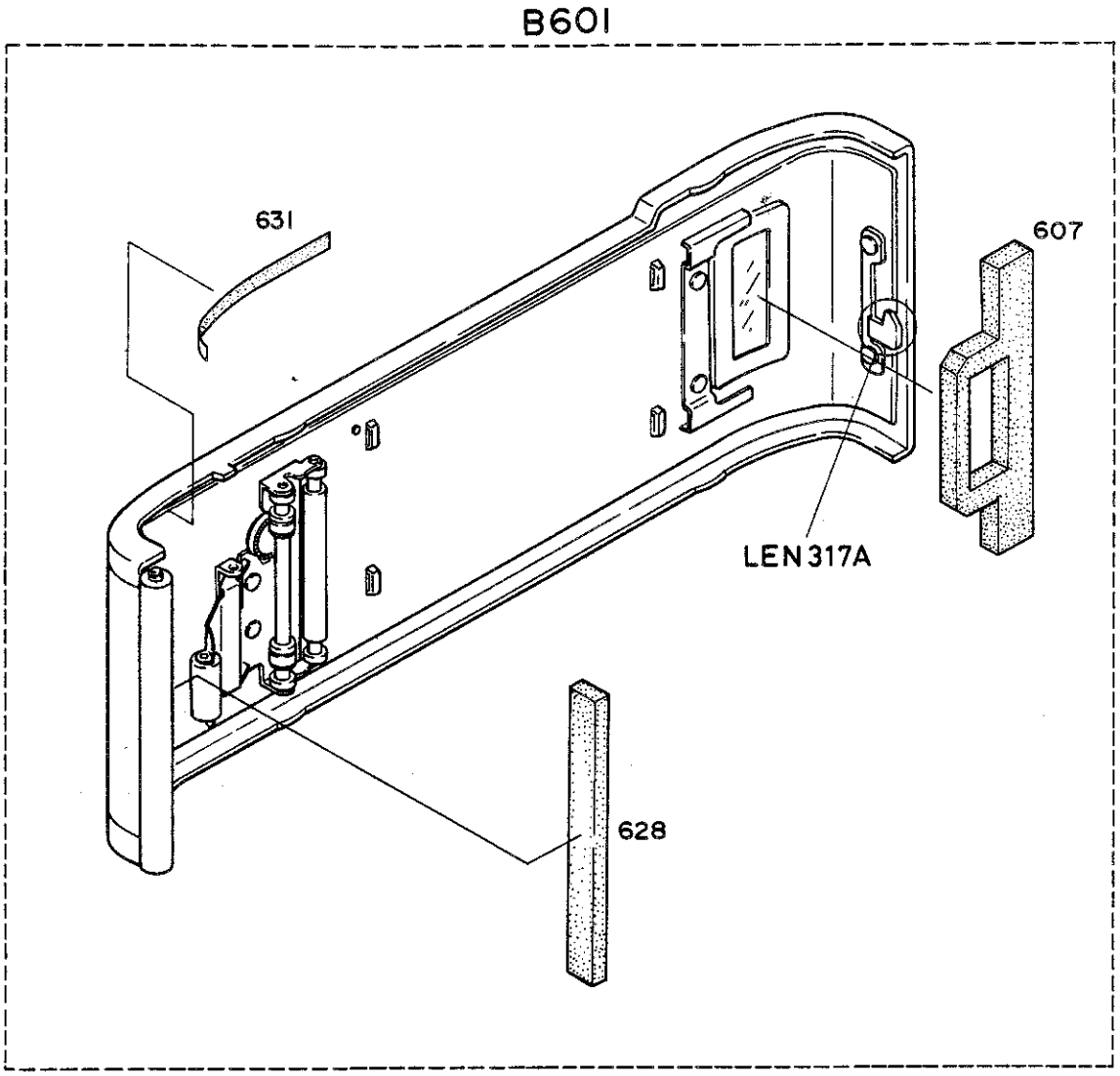

275
265
B251
VIN
RED
BLK
801 x4
(T3.0)
Adhesive
#410
760 x4
BMB32
707
MB310
MB14
BMB31
MB13
MB-3
MB32

Fig. 13



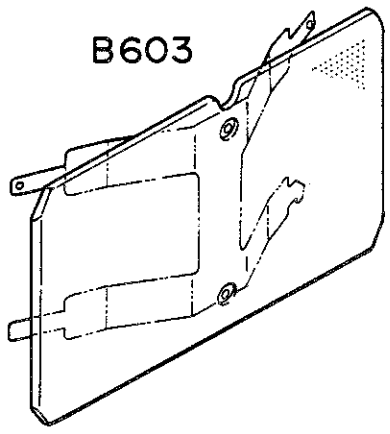


Fig. 14

15. Front plate installation

Install sprocket shaft #62. Fig.3

Set the reference shaft disk in place. Fig.3

See Fig.R1.

Operate the mirror once.
Fit the shutter set lever with the reset lever L.

See fig. R2
* The shutter set lever is to be free.

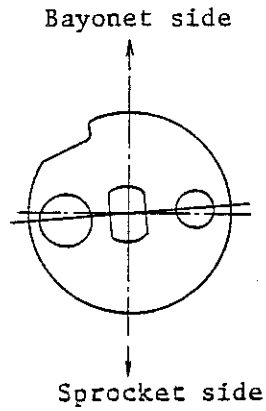


Fig. R1

Install the front plate to the body die-casting

Be careful not to catch the data back FPC lead wires.

Set shutter charge lever B52 so that the shutter set lever can be positioned as shown in Fig.R3.

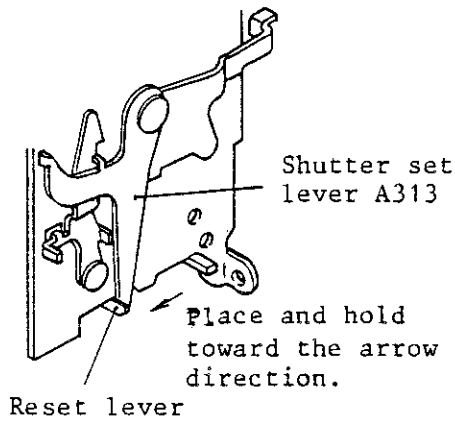


Fig.R2

Use fingers to hold the front plate and set Manual film-advance tool J15255 to the front plate.

Turn Manual film-advance tool J15255 counterclockwise.

Move the mirror up.

Turn J15255 clockwise.

Move the mirror down. To charge shutter.
Shutter is to operate.
(Shutter curtain does not open.)

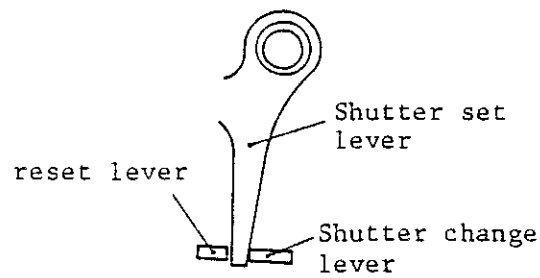


Fig. R3

Place and hold the front plate turned lower-left (film-advance side) and tighten screws according to the order indicated in Fig.R4.

Place and hold front plate toward the arrow direction.

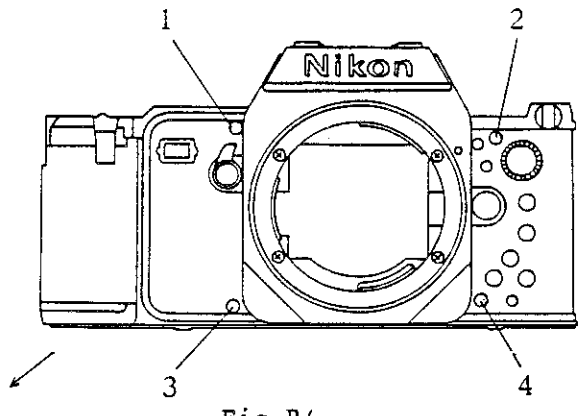


Fig.R4

Adjust the position of film-advance lever unit B121.

1

1

Set a gear under film advance lever unit B121 to the position as shown in Fig. R5.

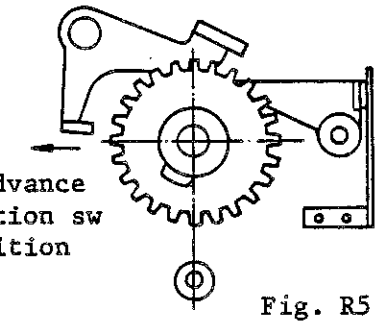


Fig. R5

Set the reference shaft disk to the installing position.
See Fig. R6

Position the cutout of Frame counter gear #105 to Direction b.

105

Position the mark on the sprocket shaft #62 to Direction a and depress it.

Fig. 3

See Fig. R7.

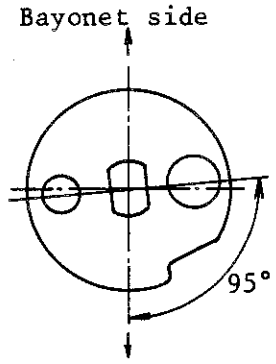


Fig. R6

Move the film-advance lath lever #94 to Direction c and install the film-advance lever unit.

Tighten three screws.
Screw #819 should be tightened first.

Fig. 10

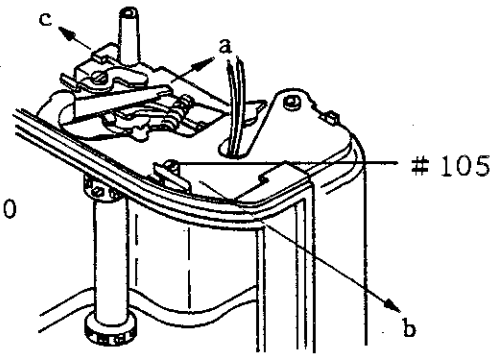
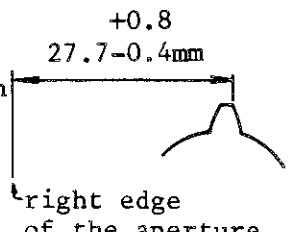


Fig. R7

Release the press-contact of the main and power switch FPCs to facilitate installation of front plate necessary. Refer to Fig. 9.

Make sure that the mirror and the shutter operate properly by turning the manual film-advance tool(J15258) counterclockwise and then clockwise.

Use finger to position sprocket teeth of film-advance completion to check the position.



16. Shutter speed accuracy adjustment

Remove Bottom cover B31 and disassemble Battery chamber B251.

Connect Tool battery J15256.

Set the voltage of DC power supply J9001-5 to 5.5V.

Use batteries.

Open camera back to set Counter tool J-15164. Release shutter.

Attach 50/1.8 AI-S lens (J18072) to camera.

Set camera to Shutter tester SF-4DNS (J19040).

Check and adjust Step 1, 2 and 3.

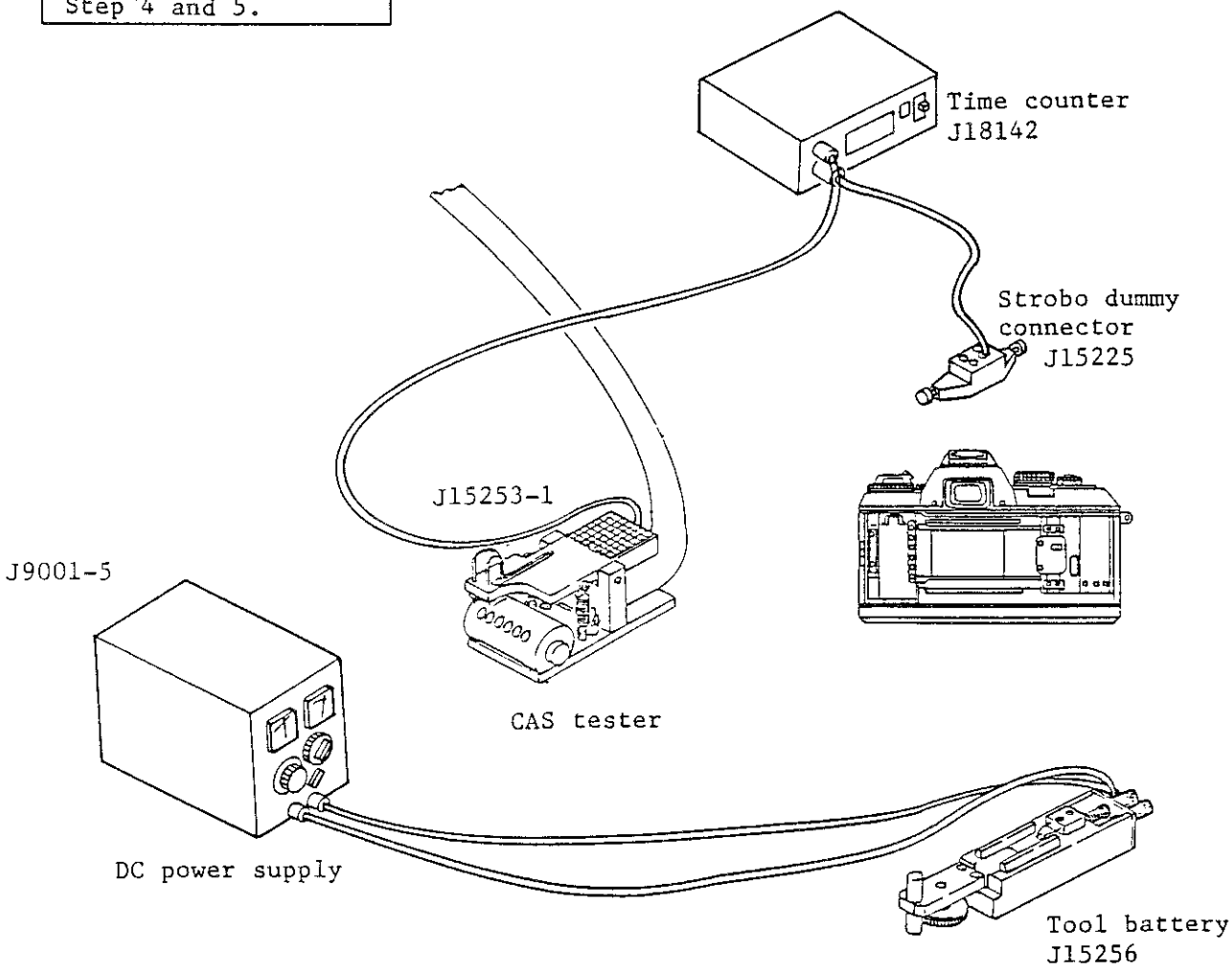
Adjustment of Step 4

Adjustment of Step 5

Set CAS tester J15253-1 and standard reflector J15196 to camera.

Connect Strobe dummy connector J15225.

Check and adjust Step 4 and 5.



Adjustment

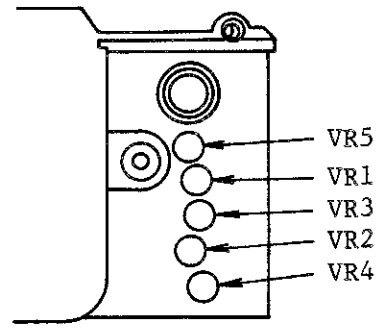
Tools:

Adjustment for Step 1, 2, 3 and 5

Shutter tester SF-4DNS (J-19040), 50/1.8 AI-S lens (J-18072)
Tool battery (J-15256), DC power supply (J-9001-5)
Counter tool (J-15164), Screw driver (J5135)

Adjustment for step 4

The above tool with: Time counter (J-15188)
Strobo dummy connector (J-15225)
Standard reflector (J-15196)
CAS tester (J-15253-1)

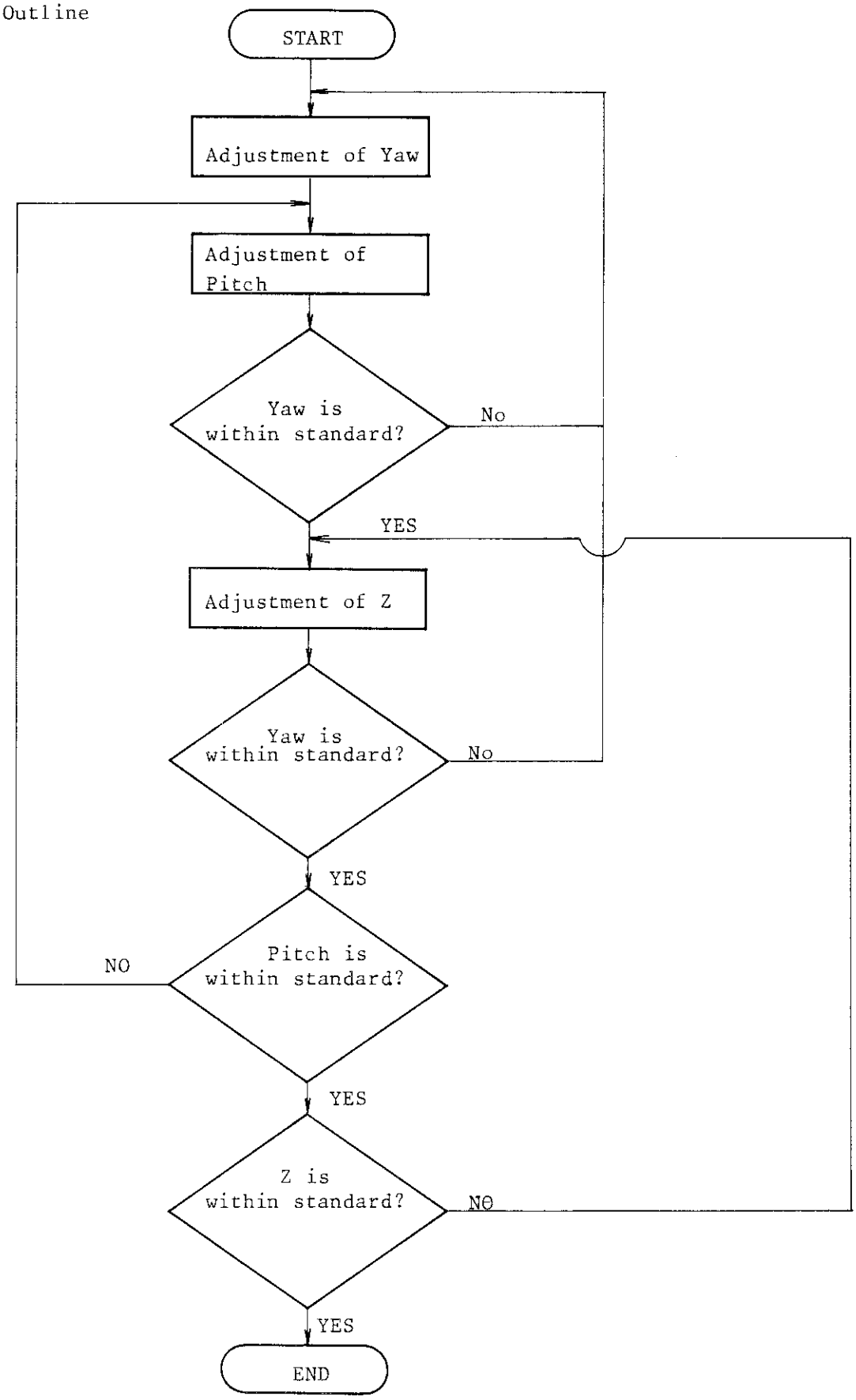


*1 If the only LED at 125 light up, it is without problem.

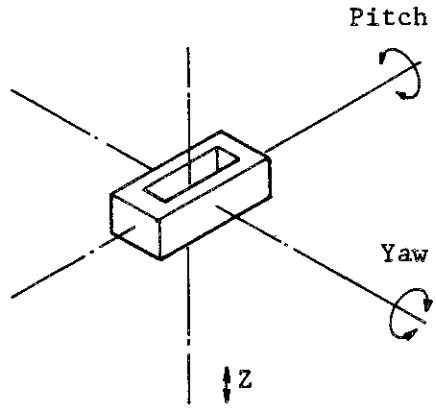
Step	Adjustment	Variable resistor	f/stop	Shutter dial	EV	ISO dial	Standard
1	Closing shutter curtain release timing	VR5	1.8	2000	15	100	0.3 - 0.57ms
2	Shutter speeds delivery on A mode	VR1	1.8	A	9	100	7.04 - 8.6ms
	Audio warning check		5.6	A	9	100	When the audible warning sw is on and the shutter release button is lightly pressed, audible warning should bleeps.
3	Display level	VR3	1.8	A	9	100	*1 1) LEDs at both 60 and 125 should light up. 2) LED at 125 should light up
	LED display check		1.8	A	9	100	LED at 125 should light up when a DX-coded film (ISO 100) is used.
4	TTL level	VR2	1.8	A	15	100	0.11 - 0.14ms (reading of time counter)
	LED display check		4	A	9	100	LED at 125 and "⚡" ready-light LED should light up. LED at 30 should blink.
5	Program level	VR4	16	P	15	100	F5.27 - F6.06 Value B of Shutter tester SF-4DNS
	LED display check		8	P	15	100	△ Both top and bottom ▽ LEDs should blink.
			16	P	15	100	△ Both LEDs should not ▽ turn on.

17. Adjustment of autofocus

Outline



Adjustment procedures



For adjustment of autofocus accuracy, perform the positioning of the sensor module.

Z: Parallel
Yaw: Inclination
Pitch: Inclination

Adjust with three screws #405 on the bottom of the body.
See Fig. 6.

Tools and measuring instruments

Shutter tester or photometric box
Adapter for Pitch (J18185)
Adapter for Yaw (J18184)
AF adjuster (J15259)
Lens for Z(fixed at 2m)(J18183)
Sine chart for Z (J18186)
CAS tester (J15253-1)
RAM tester (J15253)
ND filter 8X (J18191)
Lighting box for Z (J15264)
AAA flourescent light (J15264-2)
Transformer (J9005)
Transformer code (J15264-1)

Adjustment

When you receive the claim abont autofocus accuracy or replace autofocus FPC, front plate or mirror box, please adjust autofocus accuracy as follow;

Make sure of 46.5mm and 45°

↓

Disassemble the bottom cover, the battery holder and the battery chamber

* This is not necessary in inspecting the autofocus accuracy.

↓

Install the AF adjuster (J15259) to tripod socket.

↓

Solder two lead wires to data back FPC.

* Be sure not to connect reversely.
If the lead wires are connect reversely, DC/DC converter may be damaged.
Fixed voltage: 5.5V

↓

Take off the leatherette and set the CAS tester.

↓

Turn the power of RAM tester on and set RAM tester to test mode.

Install the adapter for Yaw(J15184) to the camera.

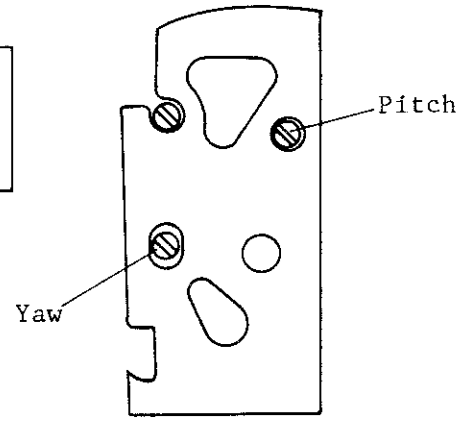
Set the camera to the calibration light source. Set to EV15.

(1) Adjustment of Yaw.

Input the command '80'.

Run

Adjust PR1 and PR2 with the screw for Yaw on the bottom of the camera so that they will come within standards(0±3mrad). See right figure.



Since the adhesive is applied to the head of screw, rotate the screw after remove the adhesive.

Reset C

(2) Adjustment of Pitch

Set the adapter for Pitch(J18185).

Set the camera to the calibration light source. Set to EV9.

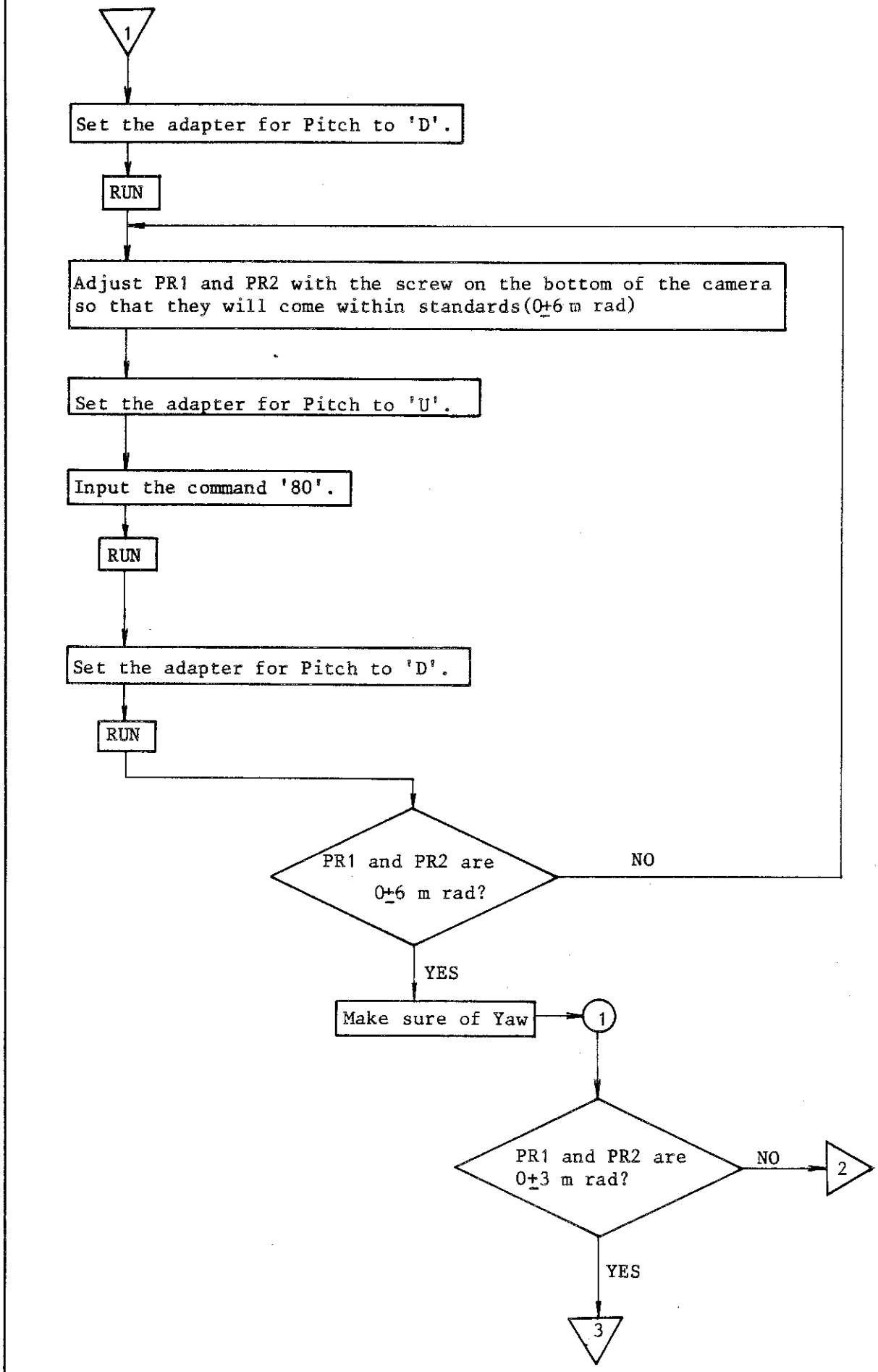
Set the adapter for Pitch to 'U'.

Input the command '80'

Run

1

* Each of PR1, PR2 and RESULT indicates 00.


1
Set the adapter for Pitch to 'D'.
RUN
Adjust PR1 and PR2 with the screw on the bottom of the camera so that they will come within standards(0±6 m rad)
Set the adapter for Pitch to 'U'.
Input the command '80'.
RUN
Set the adapter for Pitch to 'D'.
RUN
PR1 and PR2 are 0±6 m rad?
NO
YES
Make sure of Yaw
1
PR1 and PR2 are 0±3 m rad?
NO
2
YES
3

3

(3) Adiustment of Z

Set the lens for Z(J18183) and ND filter

(1) Set the chart and the camera according to certification of lens for Z.

(2) Set the camera so that the focusing bracket in the viewfinder will be positioned as shown in the right figure.

(3) Intercept the outer light.

Input the command '83'.

* If both of PR1 and PR2 indicate FF, inspect the light.

RUN

Adjust PR1 and PR2 with the three screws on the bottom of the camera so that they will come within standards 0±30μ. This value is named A.

Move the camera backward in 2.2cm and read the value of PR1 and PR2. This value is named B.

$\frac{A+B}{2}$ is 0±30μ?

NO → Adjustment of Z, to (3)

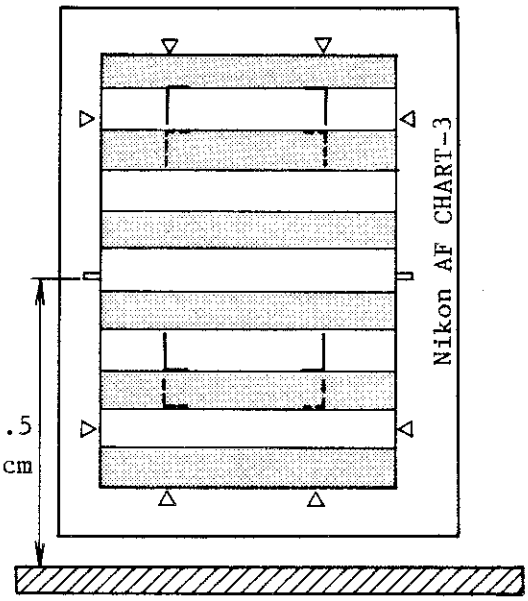
YES

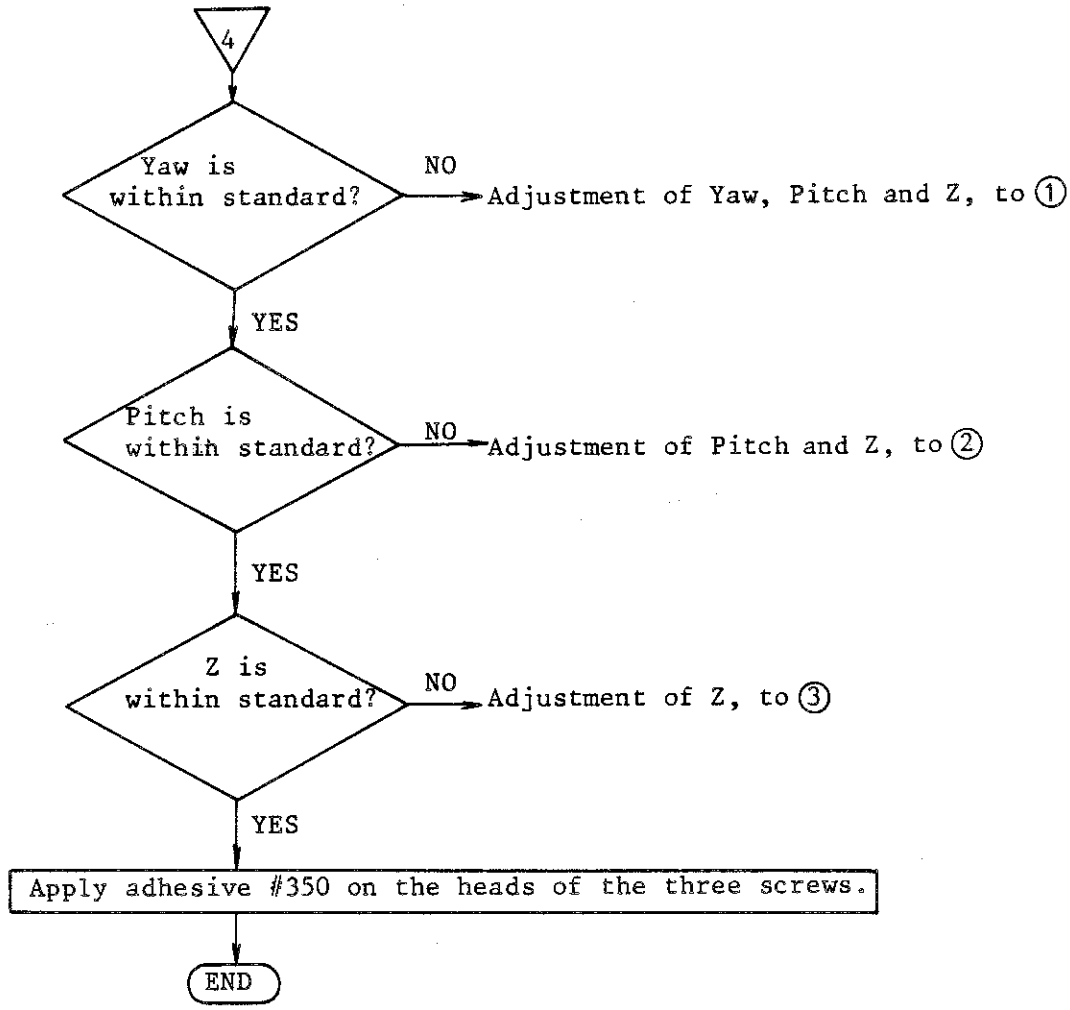
Reset C

4

How to pin the chart:

Cut the lower side of the chart and pin the chart so that the mark of the chart will be in 14.5cm from the upper surface of the lighting box.




4
Yaw is within standard?
NO
Adjustment of Yaw, Pitch and Z, to ①
YES
Pitch is within standard?
NO
Adjustment of Pitch and Z, to ②
YES
Z is within standard?
NO
Adjustment of Z, to ③
YES
Apply adhesive #350 on the heads of the three screws.
END

ELECTRIC CIRCUIT

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Electric circuit

OUTLINE OF THE F-501 CIRCUIT DIAGRAM

The electric circuit of the F-501 is mainly composed of the following nine components;

1. Power source control
2. Operation/data input processing control
3. CPU
4. Decoder, display control
5. Film-advancing motor driving control
6. AE analog calculation control
7. TTL flash output calculation control
8. Light sensitive cell, Interface
9. AF lens control and focusing

1. Power source control

Common to the F-301

2. Operation/data input processing control

The information from on-off switching and dial settings performed by a user and also the information on sequence timing are inputted into one of CPU, AF interface and AF motor control circuit.
According to the information from the AF A/M switch, which is inputted into the AF motor control circuit, only the AF motor is decided to start driving disregarding the information from the CPU.
Out of the informations from the four switches which is to be inputted into the AF interface, the remaining information, which the CPU cannot hold, is read via A/D channel of the interface module and is inputted into the CPU through the digital communication.
Other digital input data and analog input data are inputted into the CPU.
In addition to fo and f-fo signals, the data of the shutter speed dial and the ISO film speed dial are analog input data(A/D input).

CPU

Digital input data

Power hold sw	1-bit	Counter sw	1-bit
Release sw	1-bit	Program sw	1-bit
Self-timer sw	1-bit	Mirror sw	1-bit
AE lock sw	1-bit	Closing shutter curtain sw	1-bit
AF lock sw	1-bit	Film-advance completion sw	1-bit
S/C sw	1-bit		
		DX-coded film	5-bit
		FAI distinction	1-bit

Analog input data

fo signal
f-fo signal
Shutter speed dial
ISO film speed dial

AF interface(HIM)

Digital input data

AF S/C sw	1-bit
EE lens distinction	1-bit
Tele sw	1-bit
Teleconverter sw	1-bit

AF motor driving circuit (M51049P)

Digital input data

AF A/M sw	1-bit

3. CPU

Function of the CPU mainly consists of the following eight factors. 1) - 5) are common to the function of the CPU for the F-301 except that analog data of the shutter speed dial and the ISO film speed dial are inputted after A/D conversion.

1) Sequence control

2) Calculation of the viewfinder display(AE)

3) Manual shutter speed control

4) Aperture control on programmed mode

5) Shutter and aperture control on speedlight mode

6) Calculation of distance detection and viewfinder display(AF)

The data output from HSM(light sensitive cell for autofocus, CCD) are A/D-converted serially by HIM(interface) and are inputted into CPU through communication. On the basis of these data, the defocus amount is calculated in accordance with the calculation routine.
The code and the defocus amount from the reference decide the viewfinder display(×▷○◁), the lens travelling direction and the travelling amount.

7) Lens data detection

The new AF lens has the data of the field shift amout coefficient which is necessary for focusing control.
The CPU reads these data through serial I/O communication. And it is judged with the data that the new AF lens is attached.

8) Focusing control

In order to focus the lens, the motor is driven and the feedback pulse is counted by the CPU counter.
As the counter number increases (gets closer to the focus point), the motor rotation duty is changed and then, motor is stopped.
Higher focusing accuracy is available by this process.

4. Decoder dispaly control

6-bit codes from CPU are decoded to light up the AE LED and the AF LED inside the viewfinder.
6-bit codes provided from CPU are decoded and they are latched by the strobe signal to be output to command the various operations.

The operations commanded by the latched output are as follows;

1) Film-advance motor driving
2) AF motor driving
3) Timing control for the analog AE control
4) Timing control for the digital shutter speed control on manual mode
5) Aperture control magnet actuation/self-timer LED blinking
6) LED lighting during film-advancing
7) Audio warning operation
8) Power source control for the new and old type AF lens

5. Motor driving control

Common to the F-301

6. AE analog calculation control

Common to the F-301

7. TTL flash output calculation control

Common to the F-301

8. Light sensitive cell for autofocus, Interface

HIM(interface module) receives the command from the CPU and commands HSM(sensor module: CCD) to store and transfer the electric charge. Then, the output signal is A/D-converted and transmitted to the CPU as digital signal.
For this operation, the clock generator is installed in HIM to control the CCD driving sequence.

HSM stores and transfers the proper electric charge, which corresponds to the light value, at one of the component rows(for F2.8 detector or F4.5 detector) in accordance with the driving clock and the component row changeover signal output from HIM.

HIM has another six channels of A/D converter. Two channels out of them are used for $\bar{x}p$ adjusting trimmer and other four channels are for read-out of the switches which are not directly related to distance detection.

9. AF lens control and focusing

When the new AF lens is attached and its A/M switch is set to A, the AF motor can be driven by the operation of the AF motor control circuit and the AF motor driving circuit in accordance with the driving signal from the decoder latch.
The AF motor is controlled on normal rotation, reverse rotation, braking and stopping modes. And the AF lens focuses via coupling of the mount.

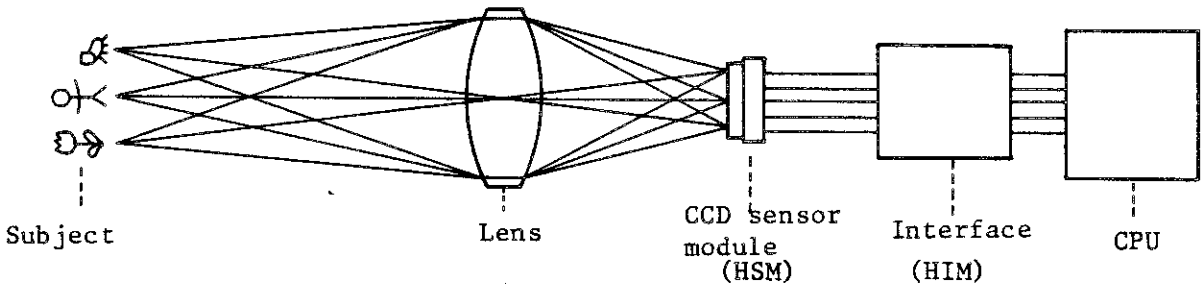
This rotation of the AF motor is converted into pulse by the plate actuating with it and the photo interrupter. This signal is waveform-shaped into 'feedback pulse' by the control circuit and transmitted to the CPU.

When the old type AF lens is attached, the driving signal from the decoder latch is transmitted to the lens contact directly.
The pulse from the relative distance terminal of the lens contact is waveform-shaped and transmitted to the CPU in the same way as the case of the new AF lens.

AUTOFOCUS SYSTEM

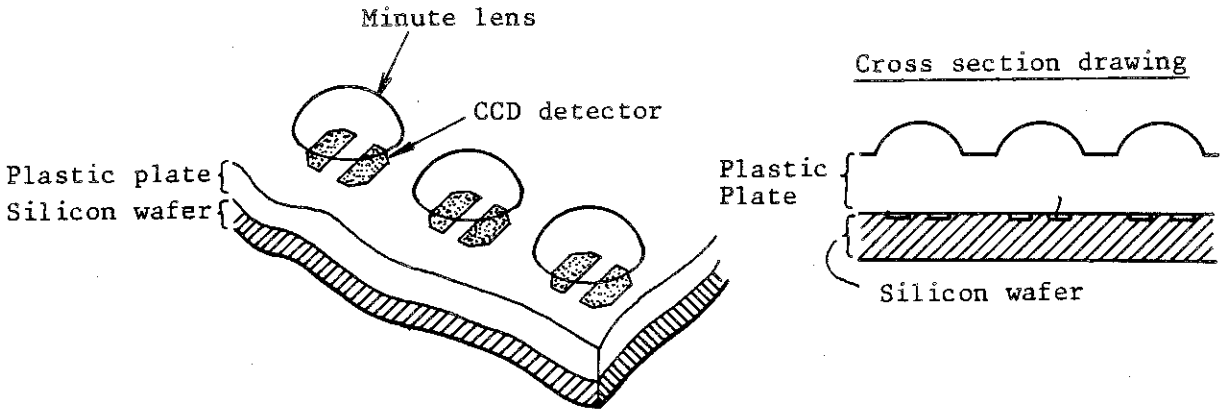
Autofocus system of the F-501 is composed of the closed loop control system which consists of the defocus detecting system by TCL system and the driving control system from CPU to the AF motor.

1. Defocus detecting system



1) Construction of the sensor module

The sensor module(HSM) of TCL is CCD.
24 pairs of detectors(48pcs) are lined in a row on the silicon wafer. A plastic plate is adhered on the silicon wafer and 24 minute lenses are built on the plastic plate (one minute lens for each pair of CCD detectors) as shown in the below figures.



2) CCD output on various lens positions

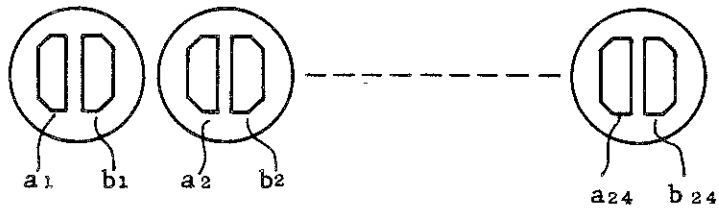


fig.1

Each detector is named as shown in fig.1.
Light each detector receives is indicated in the fig.2.

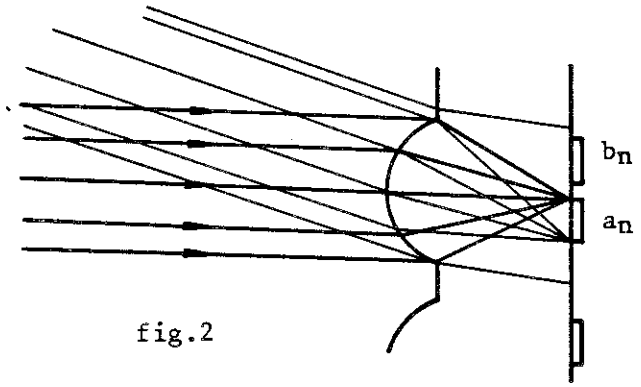


fig.2

Detector 'an' receives only the beam from the right half and detector 'bn' only from the left half as shown in fig.3.

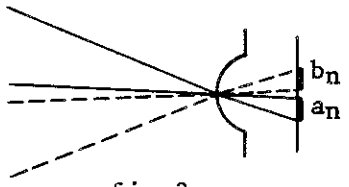
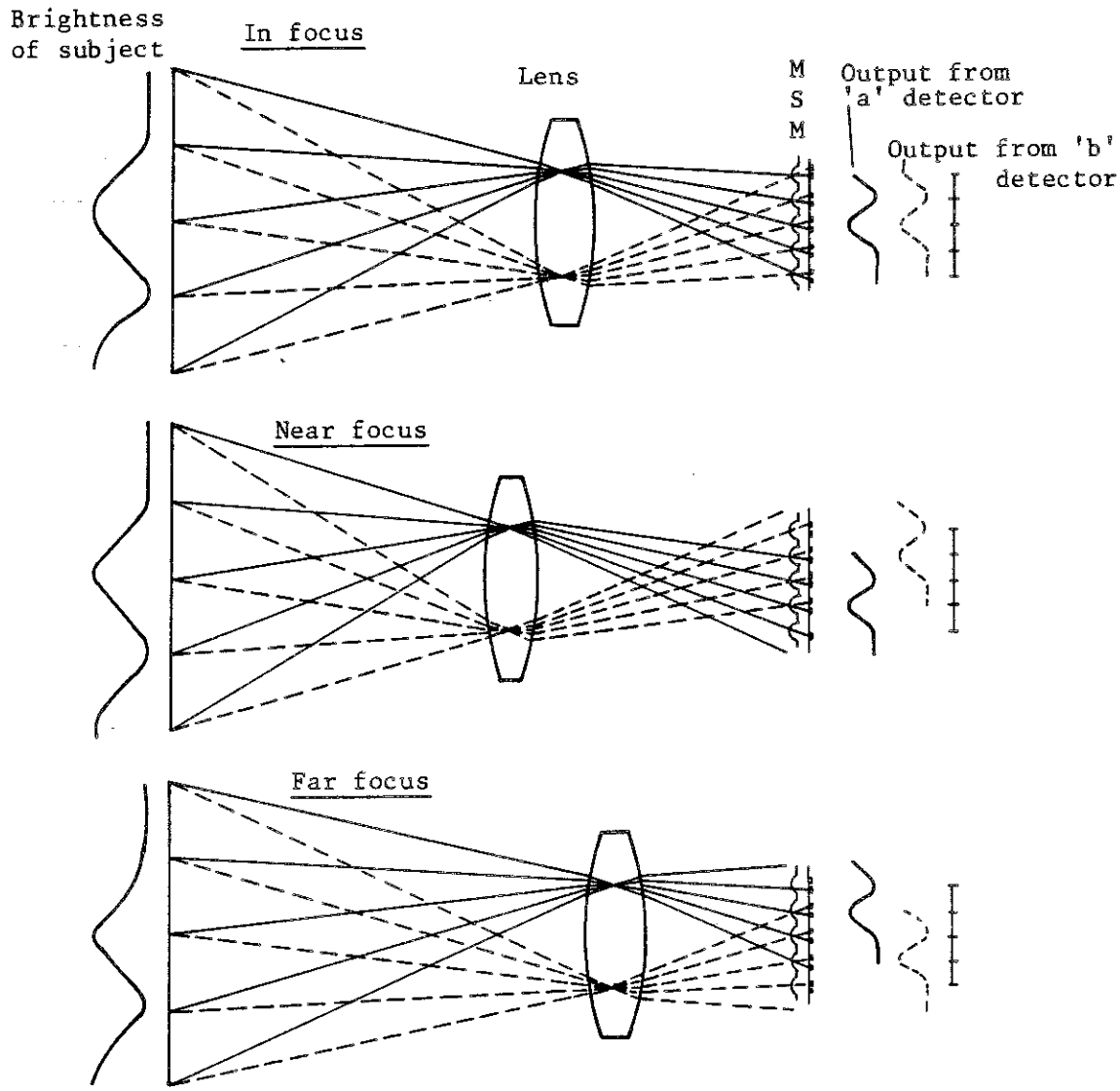


fig.3

This sensor module is located at such position as the distance from the subject to the sensor module is the same as the one to the film plane. In this condition, the output from the detectors a1 - a24 indicates the horizontal transition of light value of the subject, which is detected only from the beam of the right half.
And the output from b1 - b24 indicates the vertical transition of light value which is detected only from the beam of the left half.

Following figures indicate the three focusing conditions.



Each distance is not the same as the one actually measured.

3) Calculation of the defocus amount

In focus, the output from 'a' detector is the same as that from 'b' detector. As the lens travels to the direction of the subject, the image of 'a' detector moves to the left and that of 'b' detector to the right. Moving amout of the images of both 'a' and 'b' detectors is the same. If the lens travels to the direction of the film plane, the image of 'a' detector moves to the right and that of 'b' detector to the left.

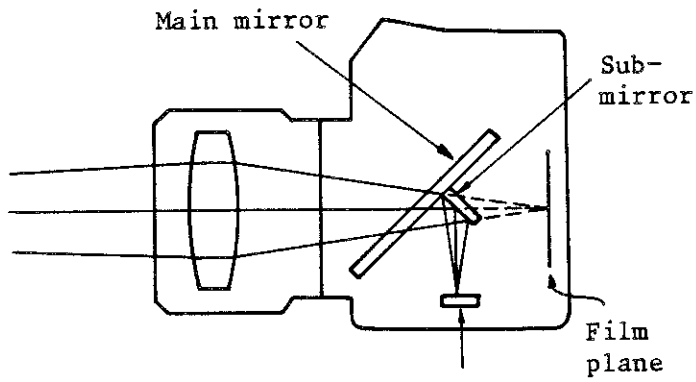
In principle, this moving amount(including +, - sign) is in proportion to the travelling amount of the lens, that is the distance from the film plane to the image formation plane on the optical axis. The coefficient is decided by the incident angle of the light to detectors. So, through the moving amount of the images of 'a' and 'b' detectors, travelling amount of the lens to the focusing point(including +, - sign) is decided.

Analog signal of the output from the sensor module is A/D-converted by the interface module(HIM). Then, it is inputted into the CPU as a digital signal. CPU calculates the above-mentioned moving amount by using the fixed algorithm.

Components of the sensor module are lined in two rows, and each detector has the different size. So, the angle in which the detectors can receive light is dependent on the detector.
The two rows of the detectors are named F2.8 detectors and F4.5 detectors. F2.8 detectors cover the lenses whose maximum apertures are F2.8 or below. And F4.5 detectors cover the lenses whose maximum apertures are above F2.8. The lenses whose maximum apertures are above F4.5 cannot be used.
Each of the F2.8 detectors and F4.5 detectors have K factor of their own, which is a ratio of the above-mentioned moving amount against the travelling amount of the lens.

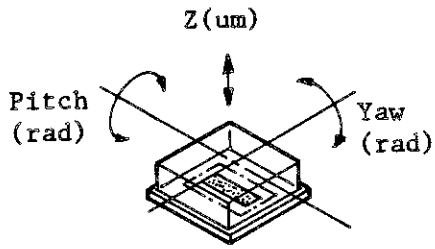
4) Alignment of the sensor module

The distance from the subject to the sensor module is made the same as the one to the film plane by the sub-mirror as shown in the following figures.



The position of the sensor module reflects directly to the focusing accuracy of the camera. So, the minute adjustment is required in aligning the sensor module.

There are three parameters for alignment as shown in the following figures.

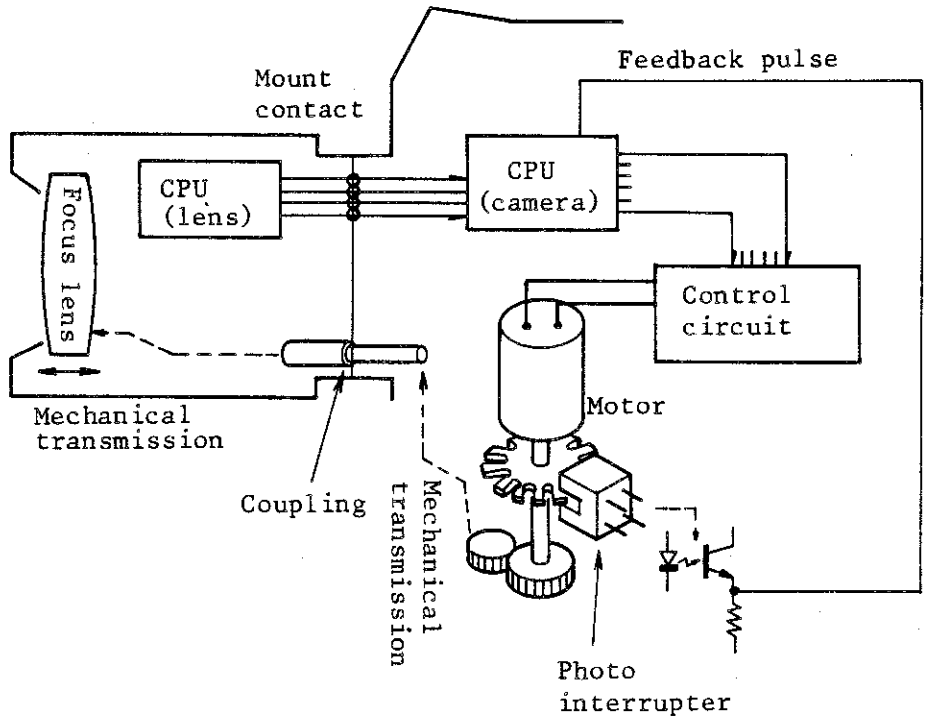


Please make adjustment by using the three adjusting screws, so that the three parameters may come close to zero.

2. AF lens driving control system

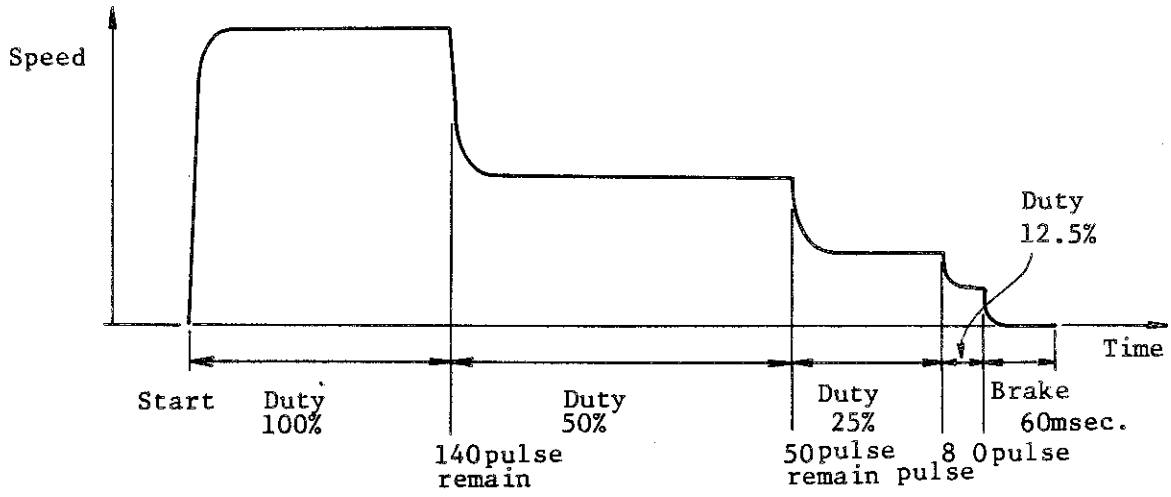
The defocus amount is calculated and given by the defocus detecting system.
AF lens driving control system drives the lens with necessary amount and stops the lens so that the defocus amount may become zero.

The following is the outline of the AF lens driving control system when the new AF lens is attached.



CPU in the camera demands that CPU in the lens should send the data of the image surface shift amount coefficient, and reads it as a digital signal through the mount contact.
The image surface shift amount coefficient shows the ratio of the rotation of the coupling on the mount against the shift amount of the image surface given by the rotation frequency. In other words, this means how many motor rotations are required for the lens travelling.
Each lens has a value of its own. With the zoom lens, the value changes depending on the focul length set.

Then, CPU in the camera calculates the rotation of the AF motor with the use of the defocus amount detected by the defocus detecting system and the image surface shift amount coefficient. If the result is out of the focusing range, the AF motor travels.
When the motor rotates, the plate rotates together with the motor shaft. Then, the photo interrupter converts this rotation into electric pulse signal. CPU counts this pulse and monitors it till it comes to the desired value.
In order to stop the motor rotation precisely when the pulse comes to the desired value, the motor rotates on four steps of rotating speed as the following graph.



When the old type AF lens which does not have CPU is attached, the image surface shift amount is uniform. The AF motor and the feedback pulse generation circuit are in the lens and the signal is transmitted to the camera via the mount contact.

Exchanging of the driving speed of the AF motor is as follows;

Till remaining 8 pulse: Duty 100%
At remining 8 pulse: Duty 50%

3. Control loop by all systems

The F-501 has three focus modes.

1) M mode (amnual focus)
Servo does not operate. Only the viewfinder display operates.

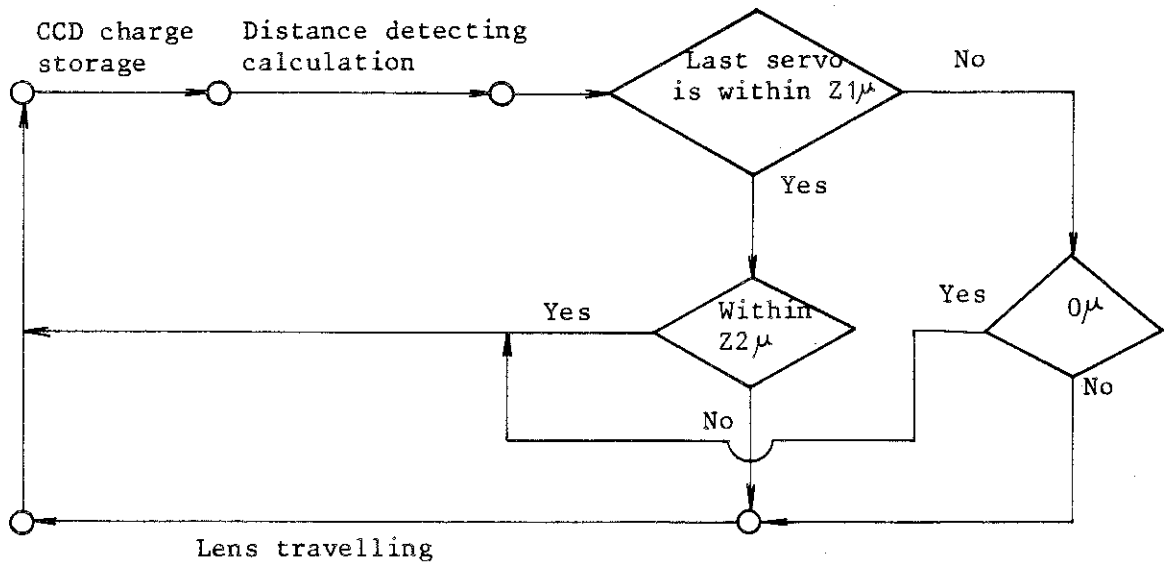
2) C mode (continuous servo autofocus)
Focus detection continues as long as the power hold switch is on.
When the power hold switch is turned off, the lens stops moving.
The focus indicator LED remains on as long as the power hold timer is on even if the finger is detached from the shutter release button.

3) S mode (single servo autofocus)

When the power hold switch is turned on, the lens start to travel.
Once focused, the lens stops travelling even if the power hold timer continues on.
If the finger is detached from the shutter release button, the lens stops travelling even before focusing.
The viewfinder display operates while the power hold switch is on.
And when the power hold switch is turned off, the viewfinder display stops operating.

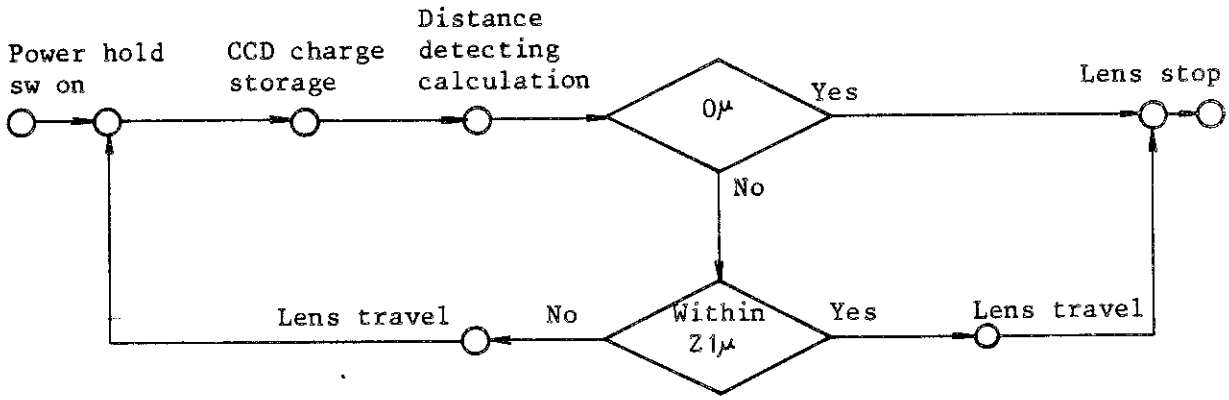
The following is control loops on C and S modes.

AF CONTROL LOOP ON C MODE(when the power hold switch is on)



If the calculatoin result from the inputted data is within Z1 , then, the defocus amount is judged to be small. And if it is within Z2 , the lens does not travel at all.

AF CONTROL LOOP ON S MODE



The power hold switch is turned on and storage, calaulation and lens travelling are repeated.
When the defocus amount is within Z1μ, the lens will be stopped after the next one cycle.

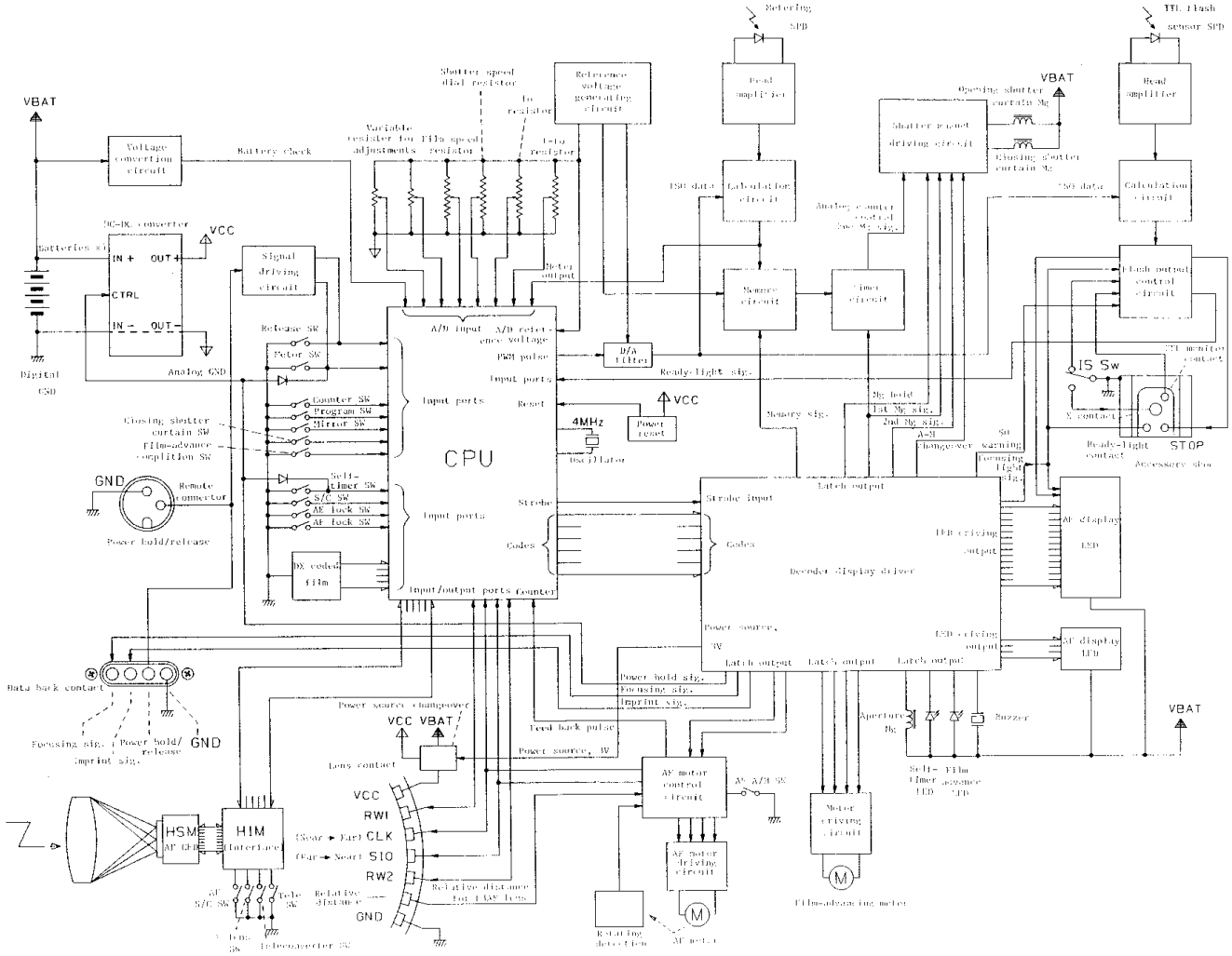
* Z1 and Z2 are the defocus amount which indicates the fixed focus judging zone. (Z1>Z2)

SWITCHES

Name	Poisition	Operation
AF A/M changeover sw	reverse side of front plate	When the focus mode selector is set to M, it is turned off and focus mode is switched to manual mode.
One shot sw	Front side of front plate	When the focus mode selector is set to S, it is turned off and focus mode is switched to single autofocus servo mode.
fmm sw	Base plate L	Tele sw: When the lens whose focal length is 135mm or longer is attached, it is turned on. Teleconverter sw: When the AI-S teleconverter is attached, it is turned on.
AF lock sw	Front side of front plate	When the autofocus lock button is pressed, it is turned on and focus is locked.

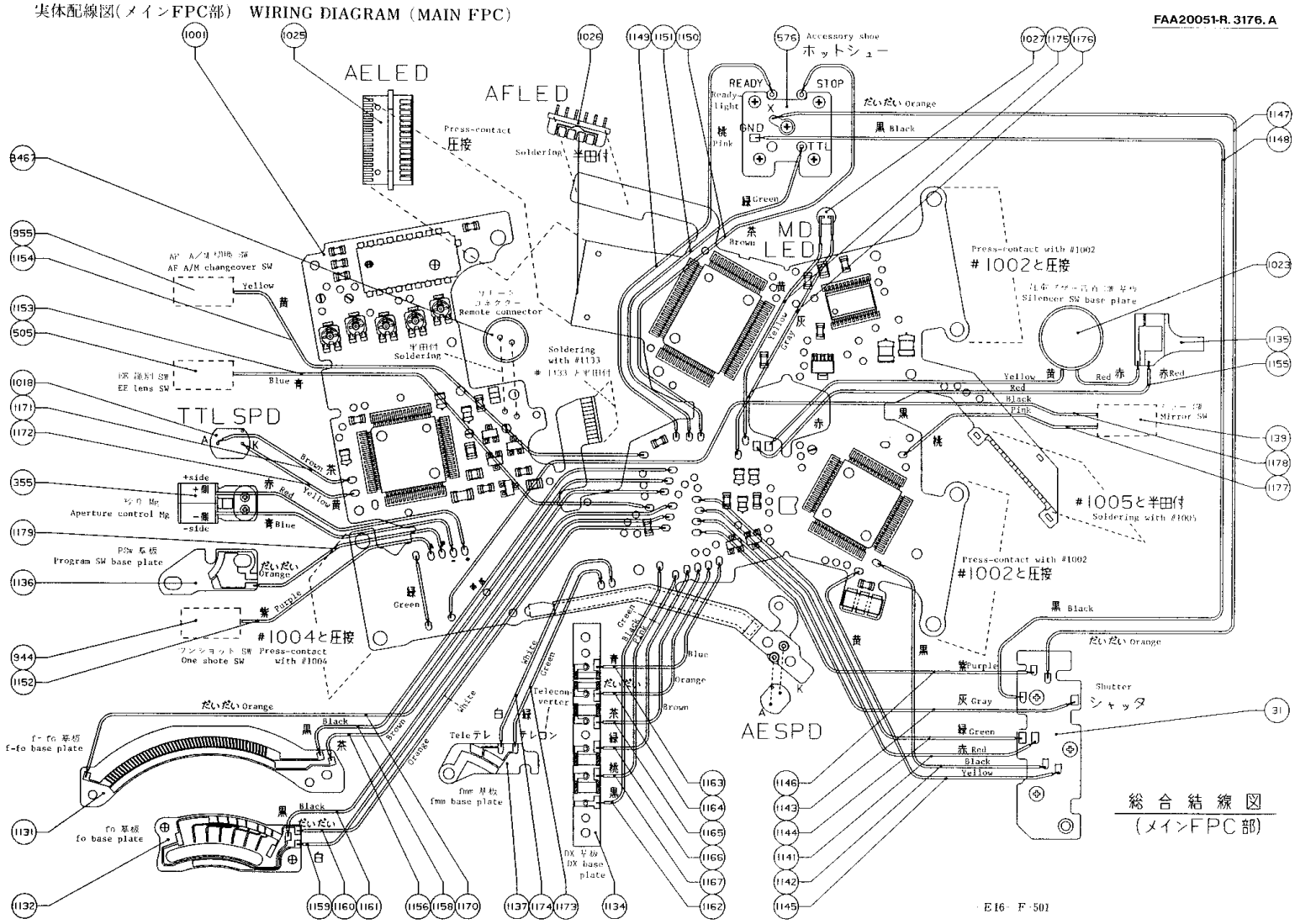
◦The operation of the other switches is same as that of the F-301. But the positions of the self-timer sw and the AE lock sw are changed.

ELECTRIC CIRCUIT BLOCK DIAGRAM



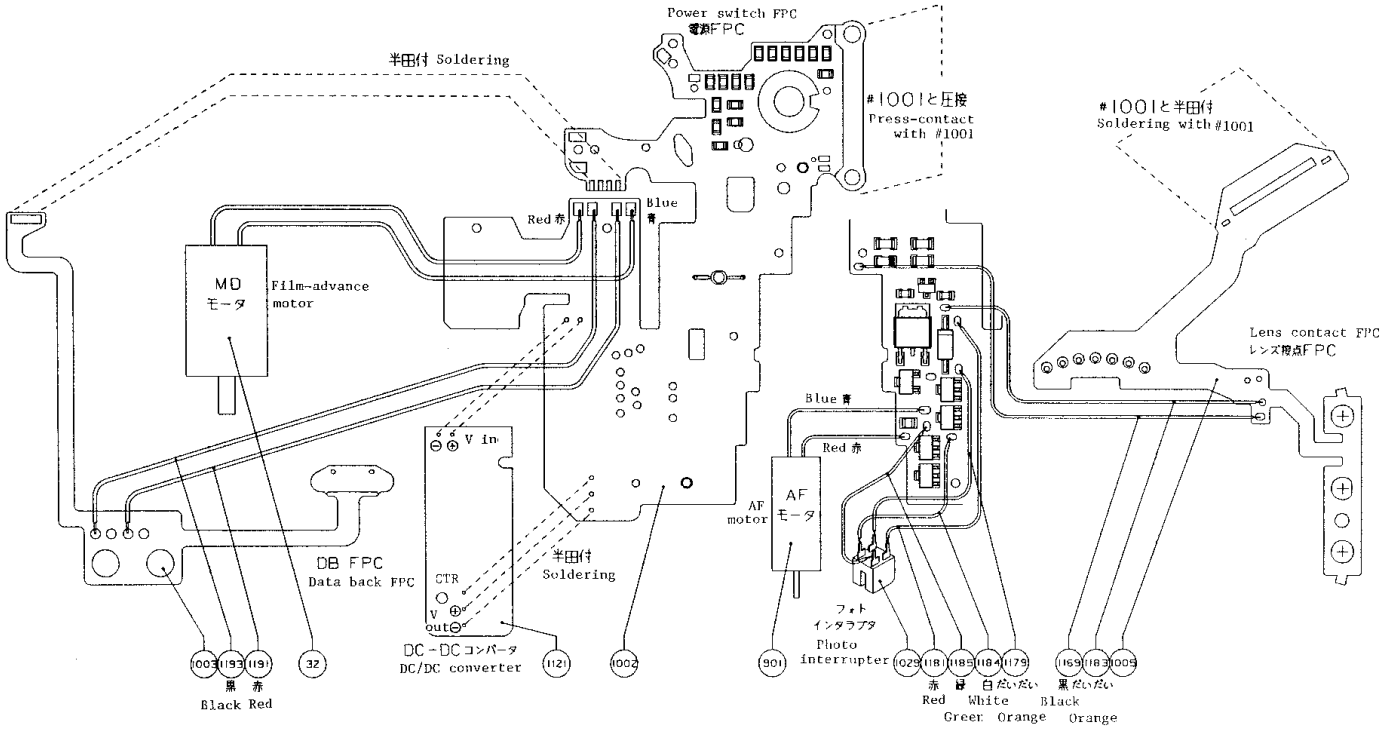
実体配線図(メインFPC部) WIRING DIAGRAM (MAIN FPC)

FAA20051-R. 3176. A



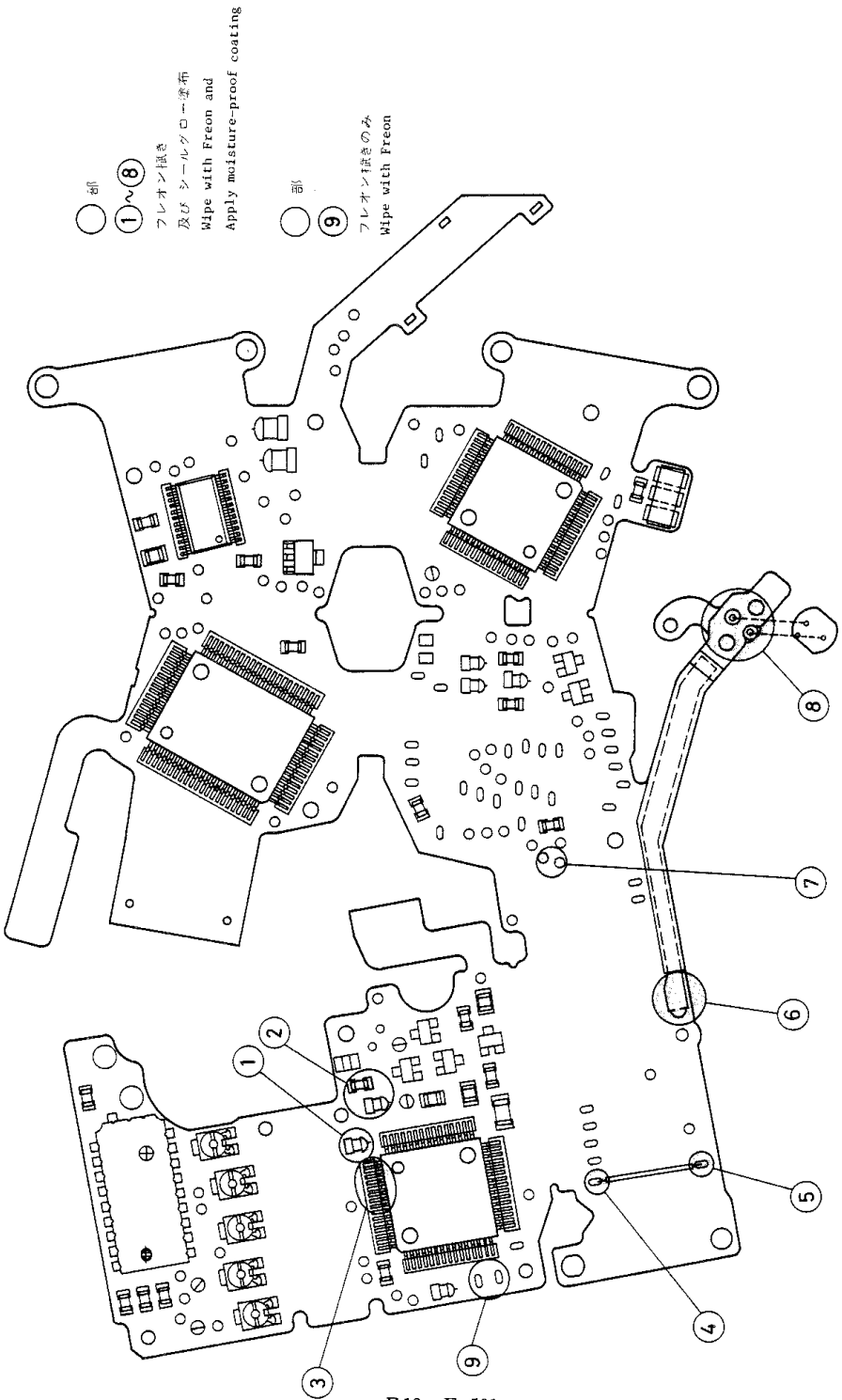
実体配線図(電源FPC部) WIRING DIAGRAM (POWER SWITCH FPC)

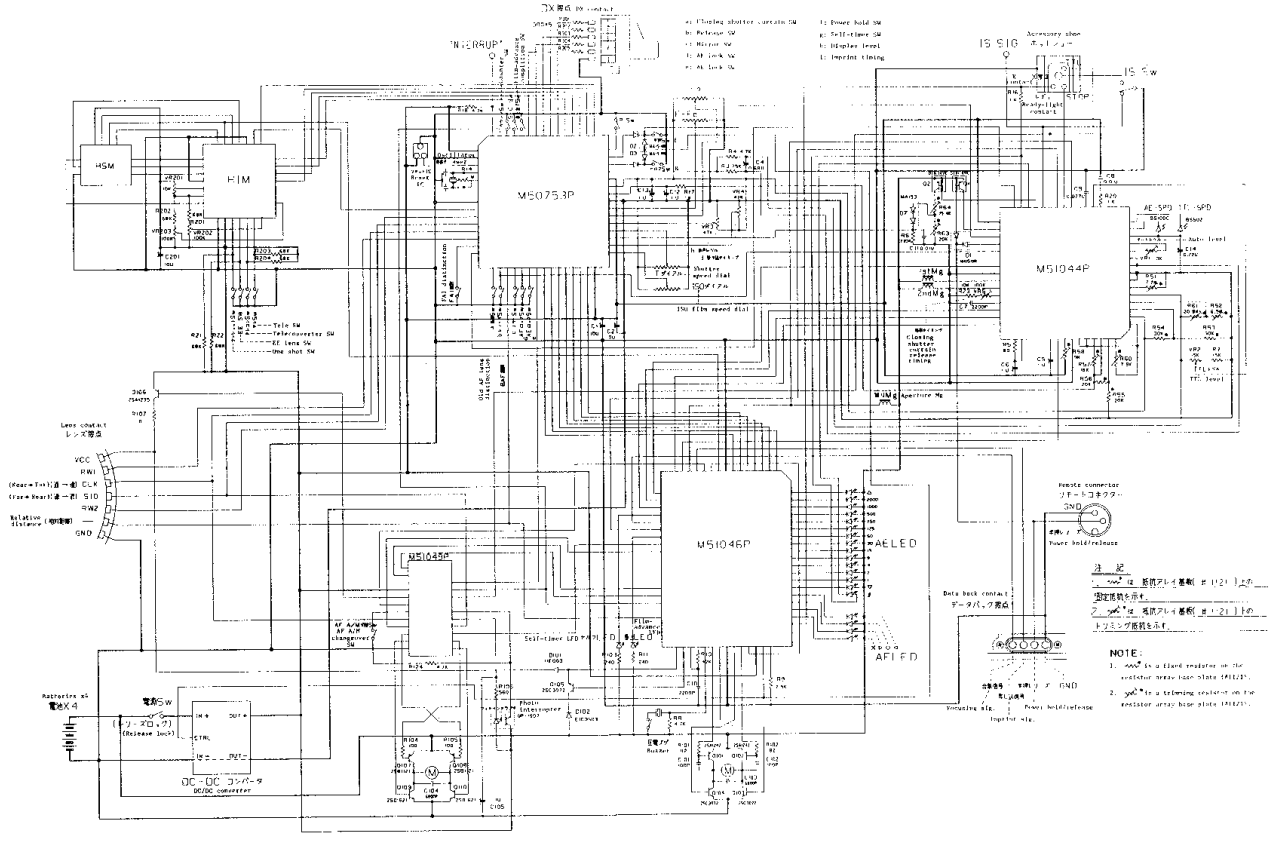
FAA20051-R. 3176. A



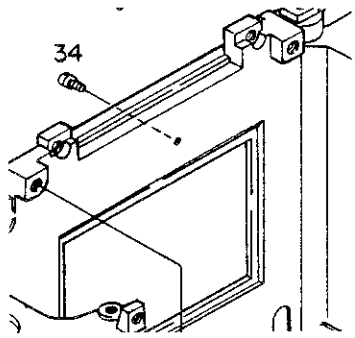
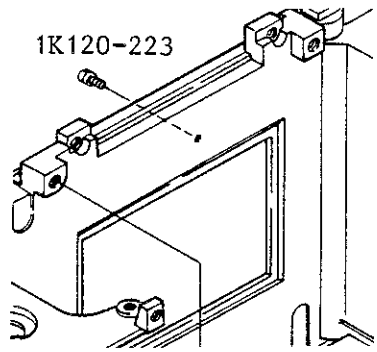
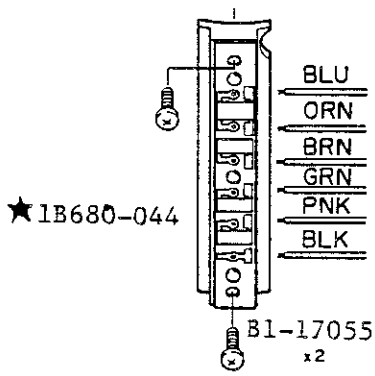
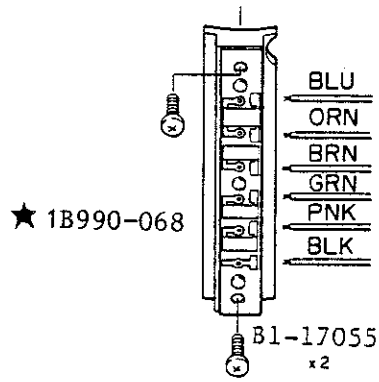
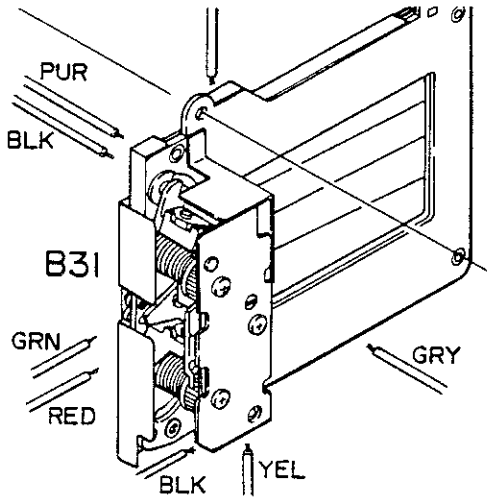
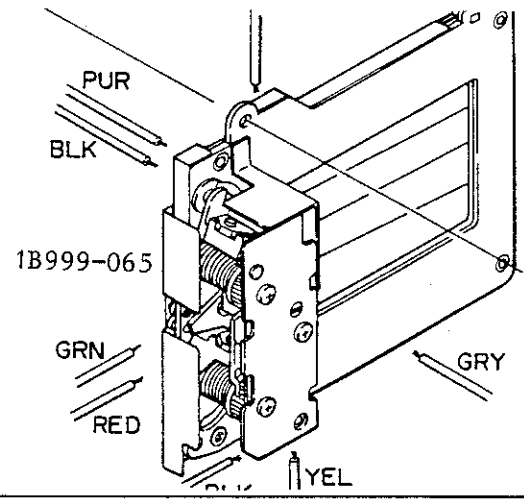
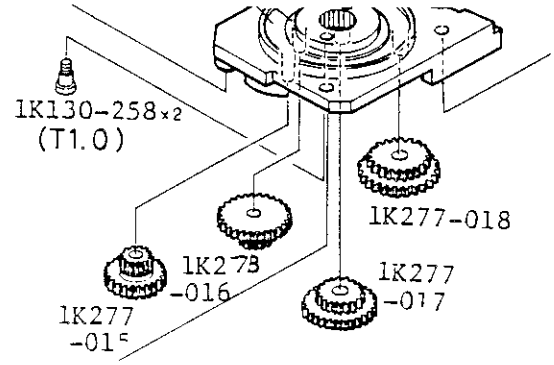
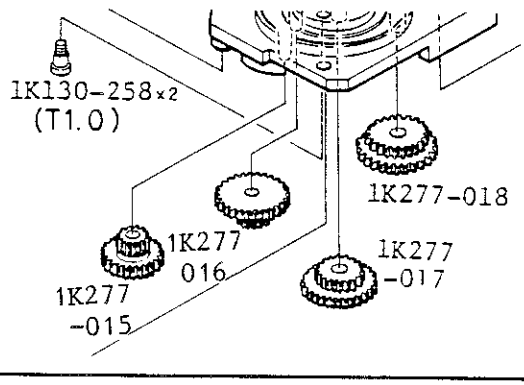
E17 - F 501

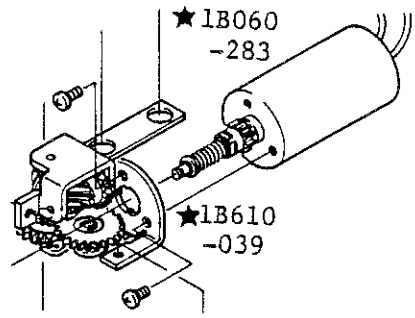
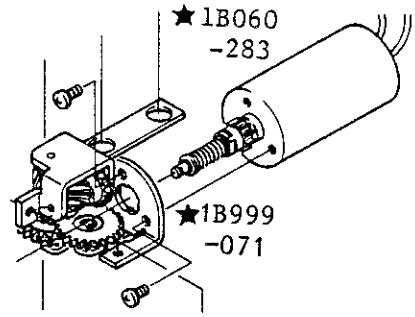
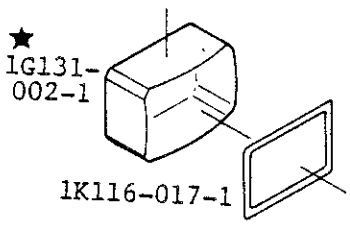
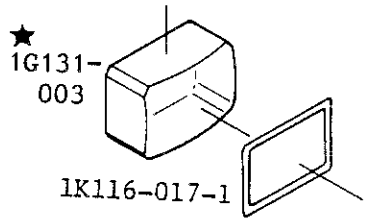
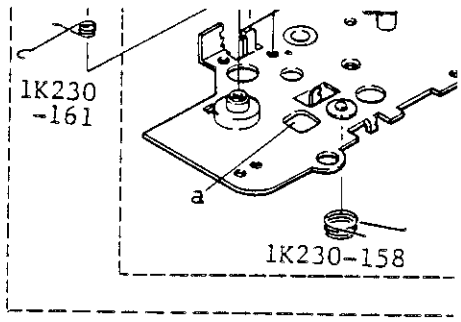
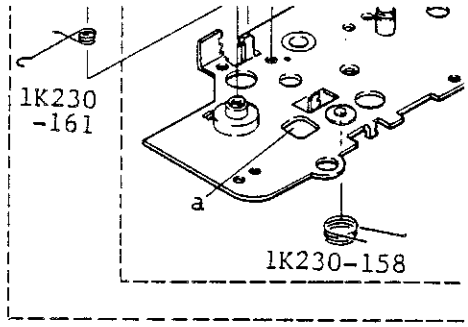
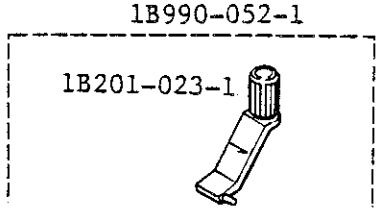
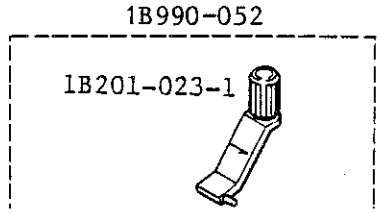
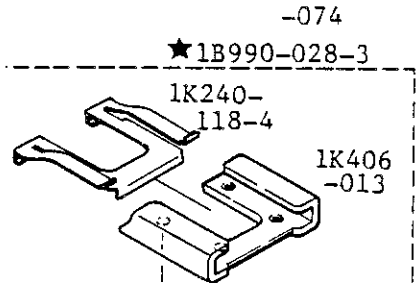
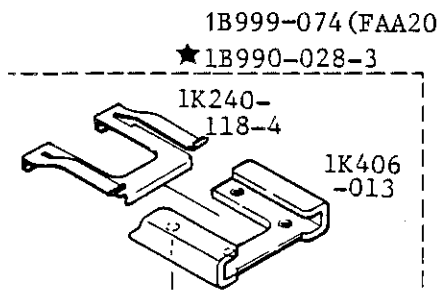
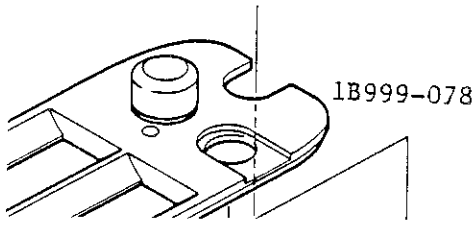
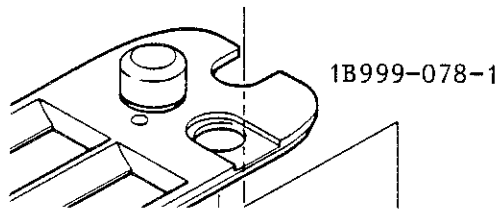
防湿塗料塗布図　MOISTURE-PROOF COATING DIAGRAM

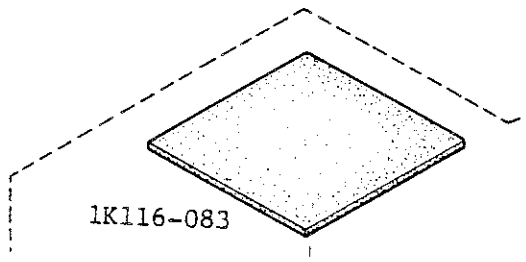
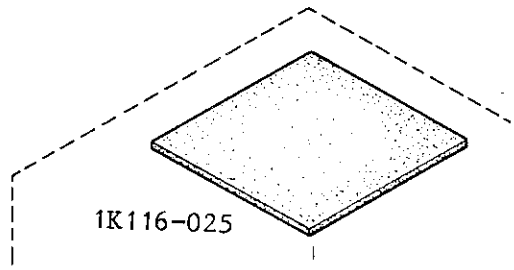



INTERRUPT
IS SIG
IS SW
HSM
HIM
M5075.3P
M51044P
M51046P
M51045P
AELED
AFLED
Lens contact
Remote connector
Data back contact
Battrerie x4
DC-DC コンバータ
DC/DC converter
NOTE:

正 誤 表　Corrections

Page	MISTAKE	CORRECT
F1 Fig. 1	Fig. 1 	
		
		
F2 Fig. 2		

Page	MISTAKE	CORRECT
F5 Fig. 5		
F8 Fig. 8		
F10 Fig. 10		
F11 Fig. 11		
F12 Fig. 12		
F13 Fig. 13		

Page	MISTAKE	CORRECT
F13 Fig. 13		

展開図追加　Additional Figure

F13a

Fig. 13-1

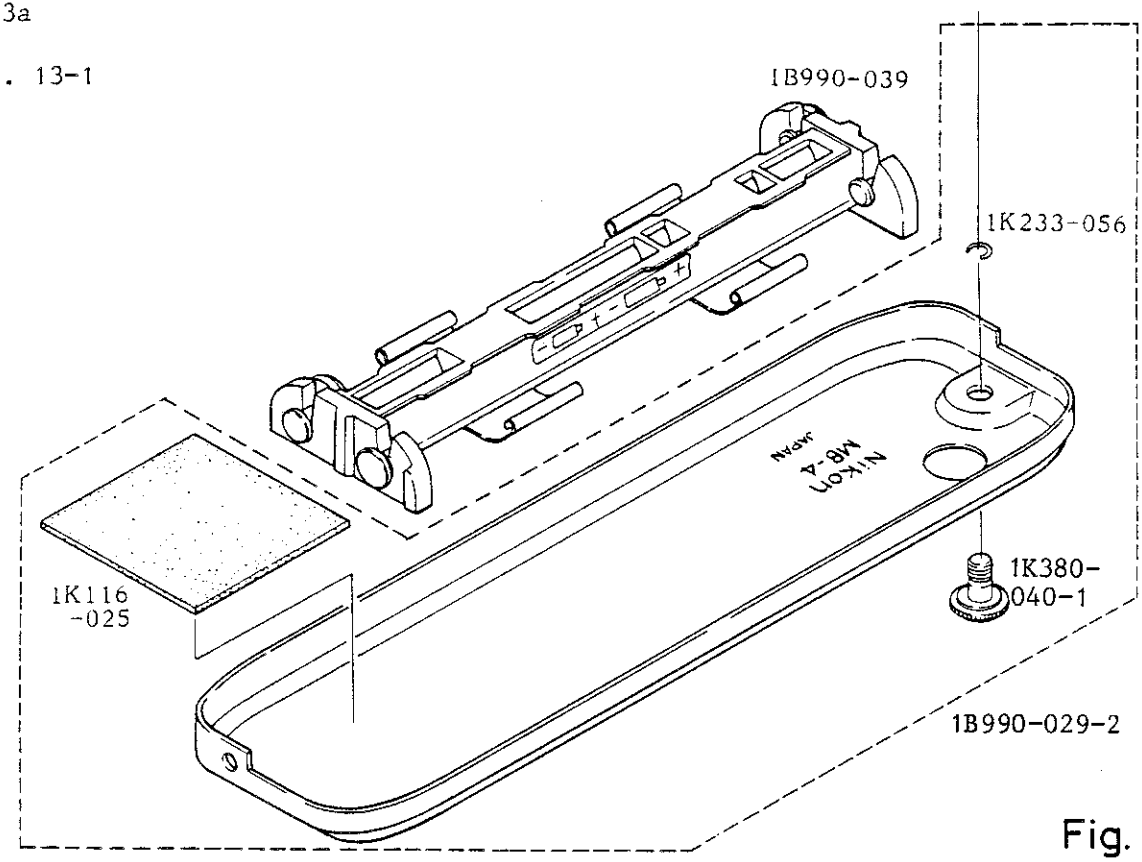
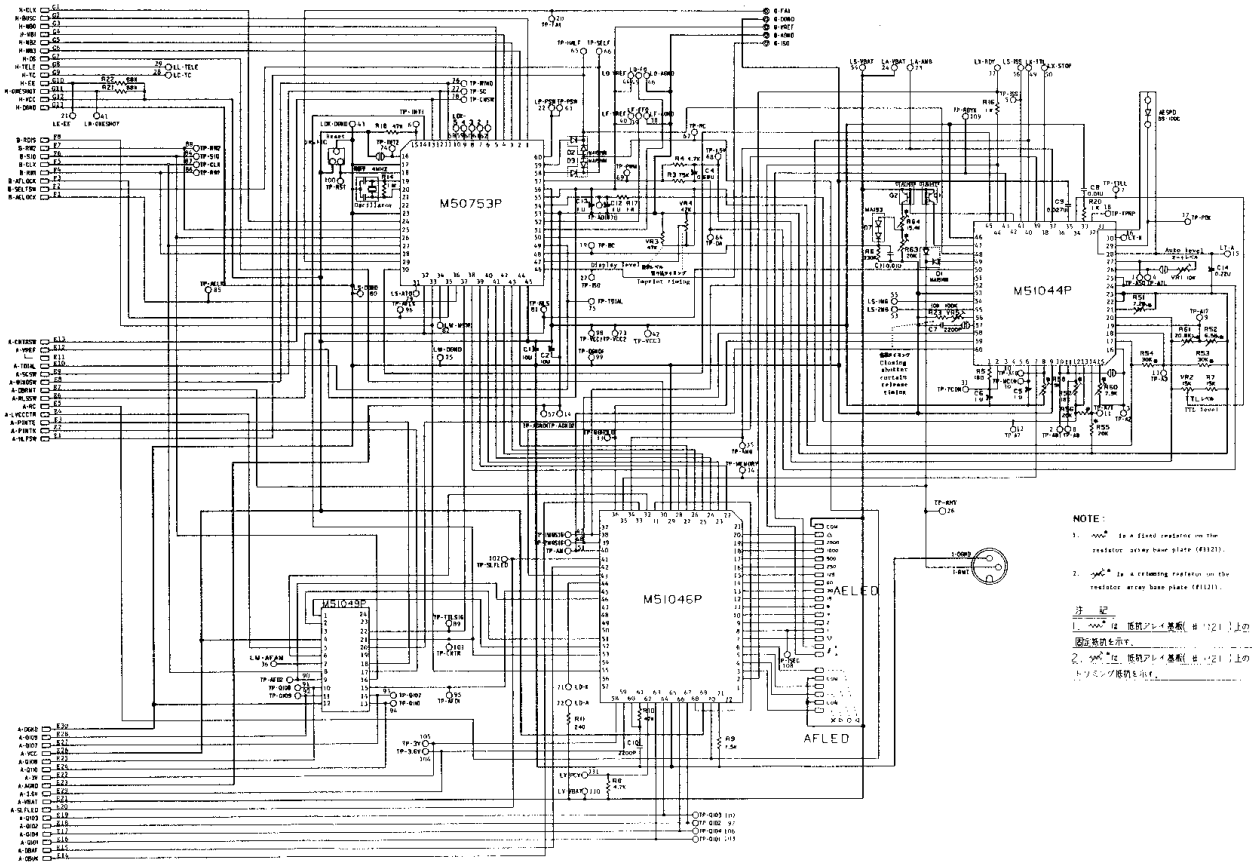


Fig. 13-1

Page	MISTAKE	CORRECT
F17	G5, 1G131-002-1	1G131-003
	MB13, 1K116-083	1K116-025
	B211, 1B680-044	1B990-068
	Additional part No.	B31, 1B999-065
F18	B561, 1B990-052-1	1B990-052
	B902, 1B610-039	1B999-071
	B4002, 1B990-062	1B990-062-2
	BMB32, 1B999-078	1B999-078-1

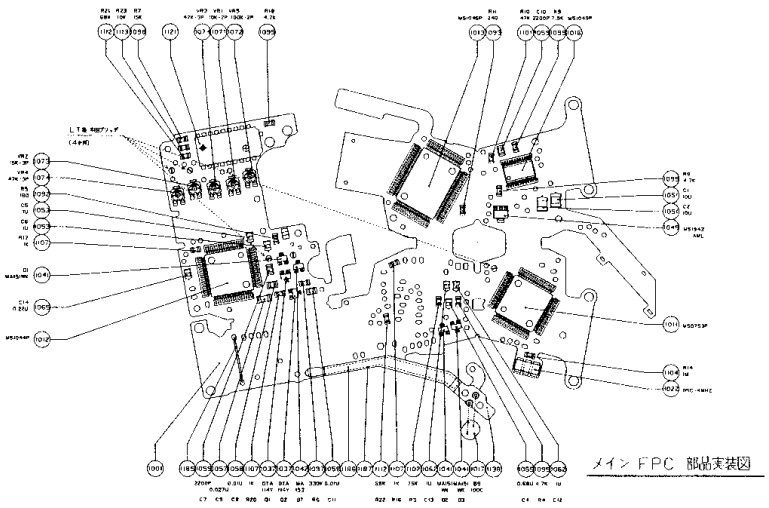
メインFPC回路図　CIRCUIT DIAGRAM (MAIN FPC)

FAA20051-R. 3176. A


M50753P
M51044P
M51046P
M51049P
AFLED
NOTE :
1. ⁄⁄⁄* is a fixed resistor on the resistor array base plate (R1121).
2. ⁄⁄⁄* is a trimming resistor on the resistor array base plate (R1121).
注記
1. ⁄⁄⁄* は 抵抗アレイ基板(R-1121)上の 固定抵抗を示す。
2. ⁄⁄⁄* は 抵抗アレイ基板(R-1121)上の トリミング抵抗を示す。

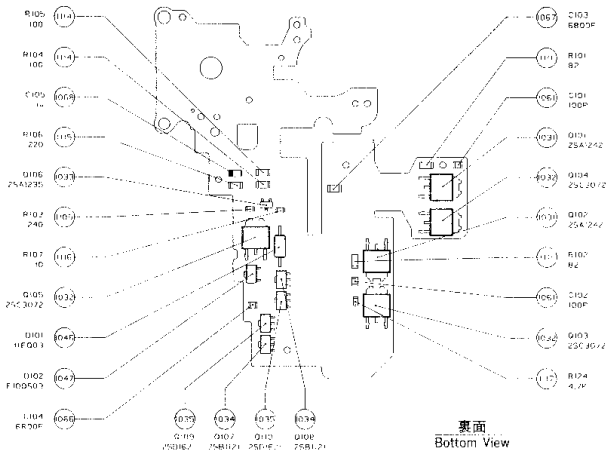
電気部品配置図　CIRCUITRY PARTS LOCATIONS

FAA20051-R. 3176. A



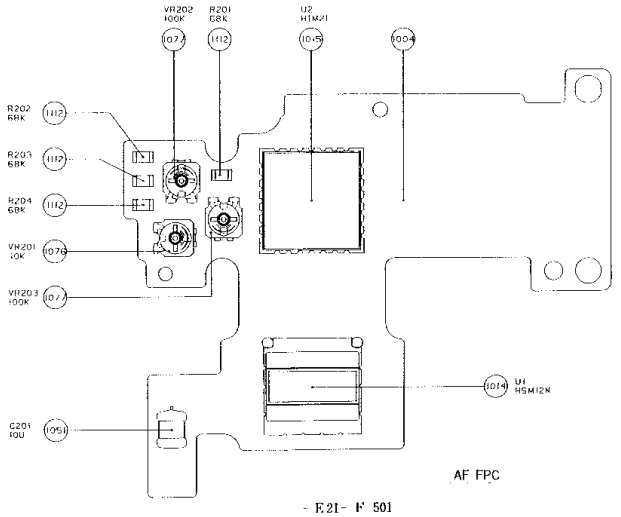
メイン FPC 部品実装図

メイン FPC
Main FPC



裏面
Bottom View

電源 FPC
Power Sw FPC



AF FPC

CIRCUITRY PARTS LIST

Index		Function	Index		Function 称
R3	75KΩ	PWM filter resistor	C101	100P	Prevention of spike
R4	4.7KΩ	PWM discharging	C102	100P	Prevention of spike
R5	180Ω	Timer C discharging	C103	6800P	Motor noise reduction C
R6	330KΩ	Battery check resistor	C104	6800P	Motor noise reduction C
R7	15KΩ	TTL level fixing	C105	1μ	Relative distance pulse condenser
R8	4.7KΩ	Buzzer discharging	C201	10μ	By-pass condenser
R9	7.5KΩ	LED current set			
R10	47KΩ	Oscillation resistor			
R11	240Ω	MD LED resistor	Q1	DTA114Y	Remote sw power-on transistor
R14	1MΩ	Oscillator resistor	Q2	DTA114Y	Battery check transistor
R16	1KΩ	Ready-light current supply control	Q101	2SA1242	MD transistor
R17	1KΩ	Filter resistor	Q102	2SA1242	MD transistor
R18	4.7KΩ	INT pull-up	Q103	2SC3072	MD transistor
R20	1KΩ	Integration condenser resistor	Q104	2SC3072	MD transistor
R21	68KΩ	HIM A/D pull-up	Q105	2SC3072	Old lens Vcc supply
R22	68KΩ	HIM A/D pull-up	Q106	2SA1235	New lens Vcc supply
R23	10KΩ	Closing shutter curtain release timing fixing	Q107	2SB1121	AF MD transistor
			Q108	2SB1121	AF MD transistor
R101	82Ω	Q101 base resistor	Q109	2SD1621	AF MD transistor
R102	82Ω	Q102 base resistor	Q110	2SD1621	AF MD transistor
R103	240Ω	Self-timer LED current supply control			
R104	100Ω	Q107 base resistor	D1	MA151WK	Remote diode
R105	100Ω	Q108 base resistor	D2	MA151WK	Remote diode
R106	560Ω	Photo interrupter current supply control	D3	MA151WK	Self-timer diode
			D7	MA153	Battery check level shift
R107	10Ω	New lens Vcc protecting	D101	11EQ03	3V protection
R124	4.7KΩ	Photo interrupter load	D102	B10QS03	Protection from reverse connection of battery
R201	68KΩ	X-BAR-P fixing			
R202	68KΩ	X-BAR-P fixing			
R203	68KΩ	HIM A/D pull-up	VR1	10K	Auto mode level
R204	68KΩ	HIM A/D pull-up	VR2	15K	TTL mode level
C1	10μ	By-pass condenser	VR3	47K	LED display level
C2	10μ	By-pass condenser	VR4	47K	Aperture stage down timing
C4	0.68μ	PWM filter condenser	VR5	100K	Closing shutter curtain release timing
C5	1μ	Memory condenser			
C6	1μ	Timer condenser	VR201	10K	HIM A/D reference adjustment
C7	2200P	Closing shutter curtain release timing	VR202	100K	HIM X-BAR-P
			VR203	100K	HIM X-BAR-P
C8	0.01μ	Integration condenser	M51044P		Head amplifier IC
C9	0.027μ	IS delay condenser	M51046P		Display, decoder IC
C10	2200P	Oscillation condenser	M50753P		MCU
C11	0.01μ	Battery check condenser	M51049P		AF driving IC
C12	1μ	Filter condenser	M51943		Reset IC
C13	1μ	Vref filter condenser	HSM12N		Sensor module
C14	0.22μ	TTL flash output control regulator	H1M21		Interface module

CHECK LANDS

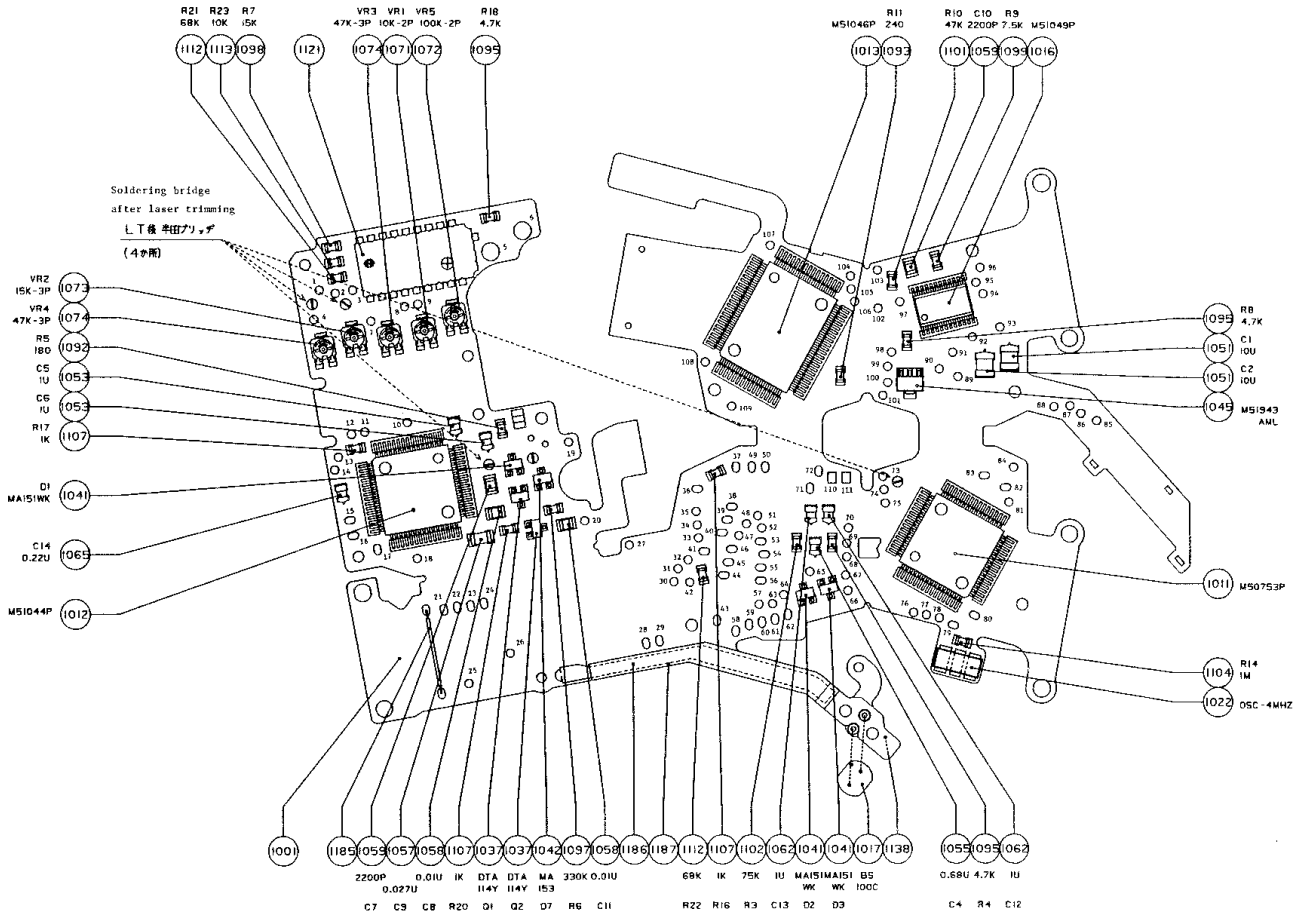
1) *Lead wire soldering terminal

2) Number in parentheses is the check land number for the F-301.

1	Auto level shift	(10)	41	BE lens sw lead wire (blue)	(40)	81	Release sw	(72)
2	f-fo reference output	(7)	42	Vcc		82	*Mirror sw lead wire (pink)	(85)
3	A2 out	(13)	43	*FAI lead wire (black)	(56)			
4	Auto level shift	(12)	44	*fo lead wire (orange)	(49)	83	GND	
5	IS terminal S	(8)	45	*fo lead wire (white)	(48)	84	SIO	
6	INT	(9)	46	*fo lead wire (black)	(47)	85	AE lock	(83)
7	TTL mode level	(1)	47	First Mg signal	(50)	86	RW1	
8	Meter output 2	(4)	48	Second Mg signal	(51)	87	Clock	
9	Shutter speed proportion 2	(5)	49	*TTL terminal (green)	(42)	88	RW2	
10	Auto τ	(15)	50	*Stop terminal (brown)	(43)	89	TTL signal	
11	Meter output 1	(2)	51	A/M changeover		90	AFD2	
12	Meter output 3	(14)	52	ISO warning		91	Q108	
13	A/D τ reference	(18)	53	*Second Mg lead wire (green)	(62)	92	Q109	
14	Analong GND	(21)	54	*V BAT lead wire (red)	(63)	93	Q107	
15	*TTL SPD A lead wire (brown)	(16)	55	*First Mg lead wire (gray)	(64)	94	Q110	
16	*TTL SPD K lead wire (yellow)	(17)	56	*IS sw lead wire (purple)	(65)	95	AFD1	
17	SPD K	(19)	57	Analog GND		96	AFLK	
18	Shutter speed proportionon 1	(20)	58	*FAI lead wire (pink)	(57)	97	Q102	(102)
19	Battery check	(92)	59	*FAI lead wire (green)	(58)	98	Vcc	
20	FAI indentification	(32)	60	*FAI lead wire (brown)	(59)	99	Digital GND	
21	*One shot sw lead wire (purple)		61	*FAI lead wire (orange)	(60)	100	$\overline{\text{RESET}}$	
22	*Program sw lead wire (orange)	(28)	62	*FAI lead wire (blue)	(61)	101	CNTR	
23	*Aperture Mg lead wire (blue)	(29)	63	Program sw	(70)	102	SELF-TIMER LED	(98)
24	*Aperture Mg lead wire (red)	(30)	64	DA		103	Q101	(99)
25	*Mirror sw lead wire (black)	(84)	65	Power hold sw	(67)	104	3.6V	
26	Remote terminal	(24)	66	Self-timer sw	(71)	105	3.0V	
27	Film speed dial		67	RC (remote control)	(69)	106	Q104	(101)
28	*Teleconverter lead wire (green)		68	1.5V	(3)	107	Q103	(100)
29	*Tele lead wire (white)		69	PWM	(68)	108	AF LED 1 sec.	(103)
30	Memory condenser	(54)	70	Meter output	(75)	109	Ready-light K	
31	Timer condenser	(53)	71	*MD LED K lead wire (gray)	(93)	110	*Silencer sw lead wire (red)	(105)
32	Integration condenser		72	*MD LED K lead wire (yellow)	(94)			
33	Mg hold	(38)	73	Vcc		111	*PVC lead wire (yellow)	(106)
34	Memory signal	(39)	74	$\overline{\text{INT2}}$				
35	Aperture Mg signal	(52)	75	Shutter dial				
36	*A/M change over sw lead wire (yellow)		76	Film-advance sw	(77)			
37	*Ready-light LED (pink)	(41)	77	AF S/C changeover sw ((AF))				
38	*f-fo lead wire (black)	(44)	78	Frame counter sw	(73)			
39	*f-fo lead wire (brown)	(45)	79	*Closing shutter curtain sw lead wire (yellow)	(87)			
40	*f-fo lead wire (orange)	(46)						
			80	*GND shutter lead wire (black)	(86)			

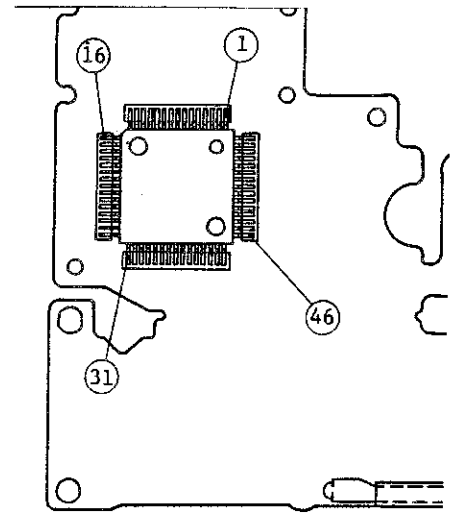
メインFPC部品実装図　COMPONENT MOUNTING DIAGRAM (MAIN FPC)

FAA20051-R. 3176. A



HEAD AMPLFIER TERMINALS

(51044)
(A1～A60)



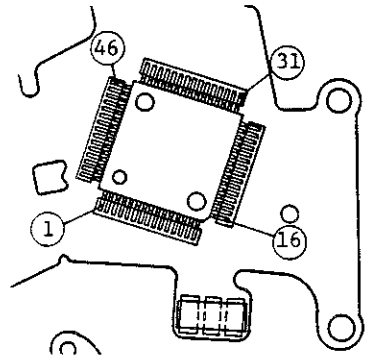
	Name	Function		Name	Function
1	Condenser discharge	Timer condenser discharge	32	T	Temperature proportion
2	A11	A11 ⊖	33	Integration condenser	Integration condenser
3	A18 out	NC	34	A13	TTL level
4	A18	NC	35	A19	A19
5	A18	NC	36	1.2V	NC
6	A9 out	Memory condenser	37	Zener	Zener
7	A9	A9 memory	38	STOP	STOP
8	A9	Auto τ	39	ISO WARNING	ISO WARNING
9	A8 changeover	A8 changeover	40	TTL	TTL
10	A8-1	f-fo output	41	ISS	IS SW
11	A8-2	f-fo output	42	Monitor	Vcc monitor
12	A8	Metering calculation output 3	43	K	Ready-light LED-Cathode
13	A7 out	Metering calculation output 2	44	A	Ready-light LED-Anode
14	A7	Metering calculation output 1	45	CPU	Speedlight Ready-light
15	A2	f-fo τ reference	46	Vcc	Vcc
16	A2 out	f-fo τ	47	RC in	Remote control
17	A3 out	A/D τ	48	RC out	Power hold
18	A3	A/D τ reference	49	RC in	Remote control
19	A17	Temperature proportion	50	RC out	Remote release
20	A17 out	D/A τ	51	NC	NC
21	A16	Temperature proportion	52	1 sig.	First Mg signal
22	A4 changeover	Analog GND	53	D GND	Digital GND
23	A GND	A GND	54	1st Mg	First Mg output
24	A4-2	D/A output	55	2nd Mg	Second Mg output
25	A4-1	D/A output	56	Timing R	Closing shutter curtain release timing resistor
26	A6	Auto level shift			
27	A5 out	Auto level shift	57	Timing C	Closing shutter curtain release timing condenser
28	A4 out	SPD-Analog			
29	A5	SPD-Cathode	58	2 sig.	Second Mg signal
30	A14	TTL-SPD-Cathode	59	Mg Hold	Magnet hold
31	A14 out	NC	60	A-M	A-M changeover

MICRO COMPUTER TERMINALS

(M50753)

C1 ~ C60

( ) ------ Terminals No in F-301.



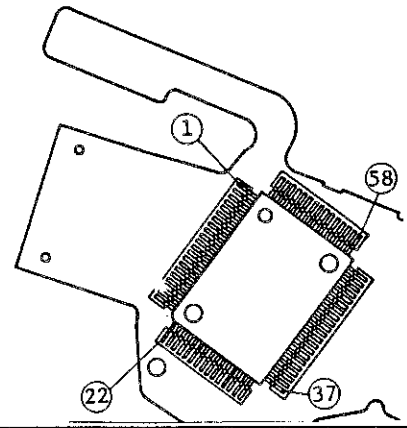
	Name	Function		I/O		Name	Function		I/O
1	P24	HIM Bus control		I/O	31	P15	Closing shutter curtain SW	(3)	I
2	P23	HIM NB3		I/O	32	P14	Release sw	(59)	I
3	P22	HIM NB2		I/O	33	P13	New/old lens distinction		I
4	P21	HIM NB1		I/O	34	P12	Mirror SW	(5)	I
5	P20	HIM NB0		I/O	35	P11	AF lock SW		I
6	P37	DX 4	(6)	I/O	36	P10	AF lock SW		I
7	P36	DX 3	(7)	I/O	37	P07	TTL flash unit distinction		I
8	P35	DX 2	(8)	I/O	38	P06	Strobe signal T	(38)	O
9	P34	DX 1	(9)	I	39	P05	Decoder output A	(44)	O
10	P33	DX 0	(10)	I	40	P04	Decoder output B	(43)	O
11	P32	Film-advance SW	(4)	I	41	P03	Decoder output C	(42)	O
12	P31	S-C changeover SW	(31)	I	42	P02	Decoder output D	(41)	O
13	P3	Counter SW	(58)	I	43	P01	Decoder output E	(40)	O
14	CNTR	Relative distance pulse		I	44	P00	Decoder output F	(39)	O
15	INT1	Interrupt SC-13	(15)	I	45	Vcc	Vcc		
16	INT2	Test		I	46	INT7	ISO dial		I
17	CMVss	D GND	(17)		47	INT6	Aperture stop down timing	(47)	I
18	$\overline{\text{Reset}}$	Reset CPU	(18)		48	INT5	Battery check	(48)	I
19	X IN	Clock input	(19)	I	49	INT4	Shutter speed dial		I
29	X OUT	Clock output	(20)		50	INT3	Display level	(50)	I
21		NC			51	INT2	fo	(51)	I
22		NC			52	INT1	f-fo	(52)	I
23	Vss	D GND			53	A Vss	Analog GND	(53)	
24	2 ϕ	HIM clock			54	INT0	Metering output	(54)	I
25	P43	AF lens signal	R/W2		55	V ref	A/D reference voltage input	(55)	
26	P42	AF lens signal	SI/O	I/O	56	A Vcc	Vcc	(56)	
27	P41	AF lens signal	CLK	I/O	57	PWM	PWM	(57)	
28	P40	AF lens signal	R/W1	I/O	58	P27	Self-timer SW		I
29	P17	FAI distinction	(11)	I	59	P26	Power holding SW		I
30	P16	Speedlight ready-light sig.	(29)	I	60	P25	Strobe program SW		I

DISPALY DECODER IC TERMINALS

M51046P

(B1 ~ B72)

( ) ----- Terminals No. in F-301.

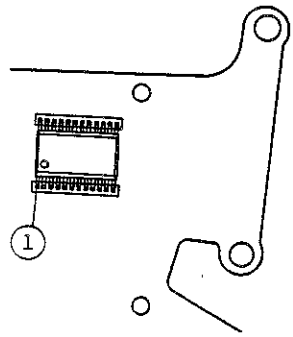


	Name	Function
1		NC
2	O19	Ready signal (Focusing light)
3	O1	Low contrast ×
4	O2	Near ◁
5	O3	Correct ○
6	O4	Far ▷
7	O5	Under ▽ (15)
8	O6	1 (14)
9	O7	2 (13)
10	O8	4 (12)
11	O9	8 (11)
12	O10	15 (10)
13	O11	30 (9)
14	O12	60 (8)
15	O13	125 (7)
16	O14	250 (6)
17	O15	500 (5)
18	O16	1000 (4)
19	O17	2000 (3)
20	O18	Over △ (2)
21		NC
22	A	Strobe A (16)
23	B	Strobe B (17)
24	C	Strobe C (18)
25	D	Strobe D (19)
26	E	Strobe E (20)
27	F	Strobe F (21)
28	T	Strobe T (22)
29	GND	GND (23)
30	Q20	TCL selection
31	Q19	Power source control for F3 AF lens
32	Q18	AF lens selection
33	Q16	Data back imprint (27)
34	Q15	Aperture Mg (28)
35	Q14	Memory (26)
36	Q 1	1st and 2nd Mg off
37		NC
38	Q 2	1st Mg (31)

	Name	Function
39	Q3	2nd Mg (32)
40	Q4	A-M changeover (33)
41	Q5	Self-timer LED (34)
42	Q6	Focusing signal
43	Q7	ISO warning (29)
44	Q13	Motor drive LED (37)
45	A1	AF motor Far → Near
46	A2	AF motor Near → Far
47		NC
48		NC
49		NC
50		NC
51	P4	AF lock detection for F3 AF lens
52	P5	AF lock detection for F3 AF lens
53	P6	Relative distance pulse
54	P7	NC
55	RDIS	Relative distance for F3 AF lens
56		NC
57		NC
58	3V	3V
59	3.6V	3.6V
60	S1	Oscillation circuit (48)
61	S2	Oscillation circuit (49)
62	Osc	Oscillation output (50)
63	MD1	MD1 Motor driving (51)
64	MD3	MD3 Motor driving (54)
65	GND	GND
66	MD4	Motor driving (55)
67	MD2	Motor driving (52)
68	CTR	3.6V control (56)
69	Vcc	Vcc (57)
70	RC	Remote control (58)
71	IL	I LED (59)
72	NC	NC

AF MOTOR DRIVING IC TERMINALS

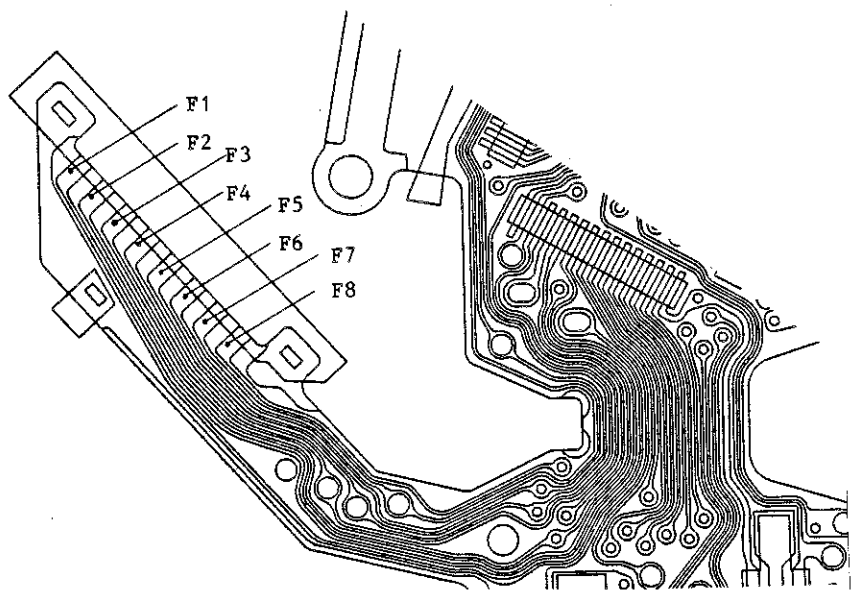
M51049P
D1 ~ D24



	Function		Function
1	AF lock detecting for F3 AF lens	13	MD10
2	AF lock detecting for F3 AF lens	14	MD7
3	NC	15	Far → Near
4	Vcc	16	Far → Near(for F3 AF lens)
5	Power source control for new AF lens	17	Photo interrupter LED
6	Selection of lens (new or old)	18	Relative distance
7	AF A-M changeover SW	19	NC
8	Near → Far (for F3 AF lens)	20	TTL monitor
9	Near → Far	21	Relative distance pulse
10	MD8	22	TTL mode detection
11	MD9	23	NC
12	GND	24	NC

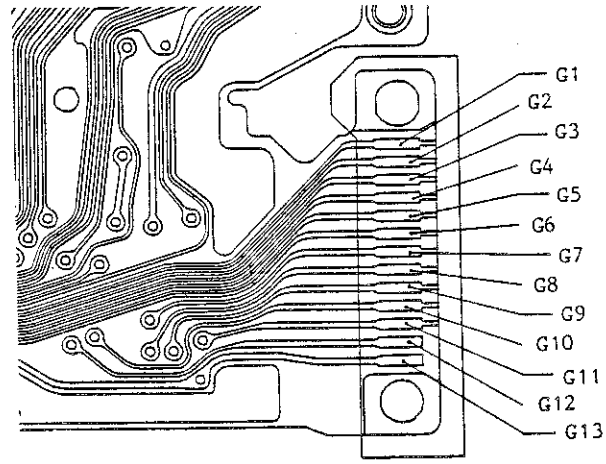
AF LENS CONTACT

F1 ~ F8



	Name	Function		Name	Function
F1	AELOCK	AE lock SW	F5	CLK	AF lens signal
F2	SELFSW	Self-timer SW	F6	SIO	AF lens signal
F3	AFLOCK	AF lock SW	F7	RW2	AF lens signal
F4	RW1	AF lens signal	F8	RDIS	F3 AF lens distinction

AF FPC TERMINAL

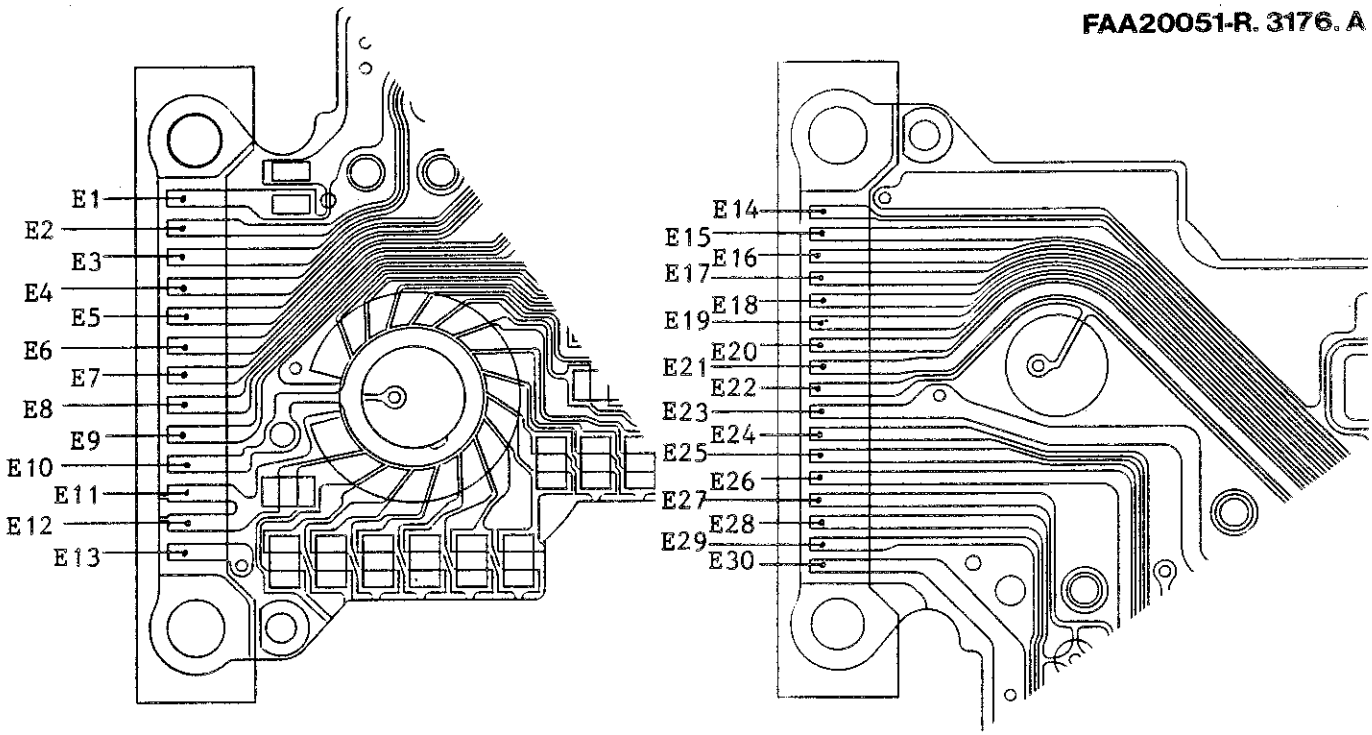


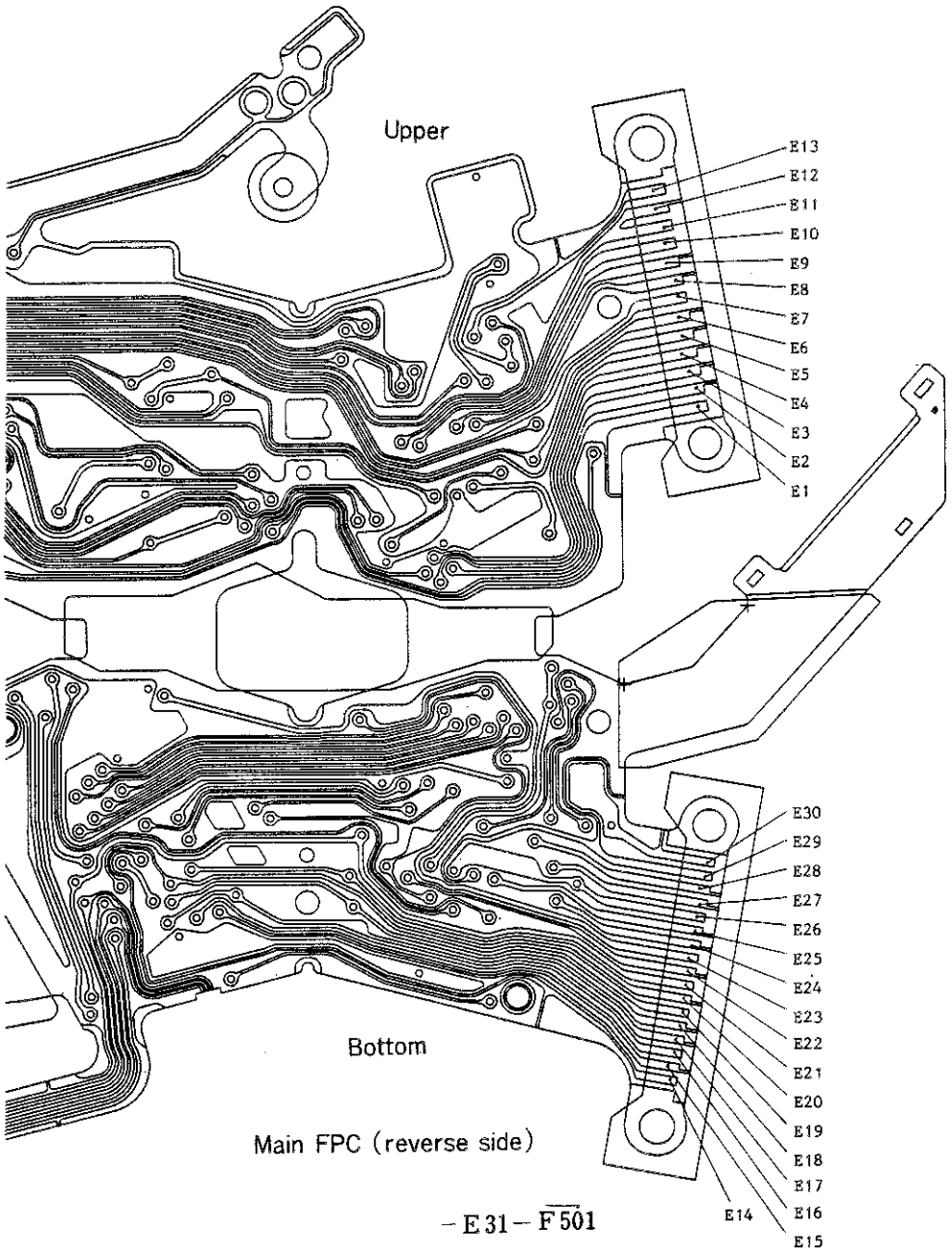
	Name	Function		Name	Function
G1	CLK	Clock	G8	TELE	Tele SW
G2	BUSC	HIM bus control	G9	TC	Teleconverter SW
G3	NB 0	HIM NB0	G10	EE	EE lens SW
G4	NB 1	HIM NB1	G11	ONESHOT	One shot SW
G5	NB 2	HIM NB2	G12	VCC	Vcc
G6	NB 3	HIM NB3	G13	DGND	GND
G7	DS	DS signal			

MAIN FPC AND POWER SWITCH FPC TERMINALS

( ) ------- Terminals No. in F-301

	Name	Function	
E1	HLE SW	Power holding SW	(E12)
E2	PINT K	Photo interruper K	
E3	PINT E	Photo interruper E	
E4	LVccCTR	Vcc control for new AF lens	
E5	RC	RC	(E20)
E6	RLSSW	Release SW	(E8)
E7	DBRMT	Data back power hold/release	(E14)
E8	WINDSW	Film-advance SW	(E7)
E9	SCSW	S/C changeover SW	(E6)
E10	TDIAL	Shutter speed dial	
E11	TVREF	Shutter speed dial reference voltage	
E12	TVREF	Shutter speed dial reference voltage	
E13	COUNTER	Counter SW	(E1)
E14	DBUK	Data back imprint signal	(E15)
E15	DBAF	Data back focusing signal	
E16	Q101	Q101 B	(E16)
E17	Q104	Q104 B	(E17)
E18	Q102	Q102 B	(E19)
E19	Q103	Q103 B	(E18)
E20	SELFLED	Self-timer LED K	(E21)
E21	VBAT	V BAT	(E23)
E22	3V	Vcc for F3 AF lens	
E23	AGND	GND	(E22)
E24	Q110	Q110 B	
E25	Q108	Q108 B	
E26	Vcc	Vcc	(E11)
E27	Q107	Q107 B	
E28	Q109	Q109 B	
E29	3.6V	3.6V	
E30	DGND	GND	

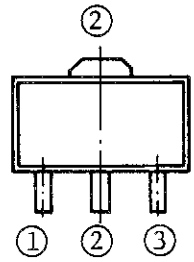




Main FPC (reverse side)

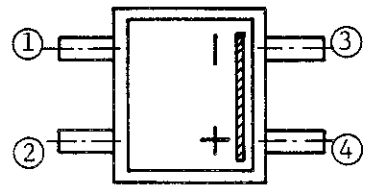
1. Power transistor

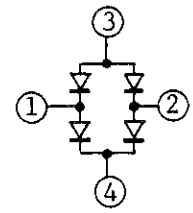
   2SD1621



① Base
② Collector
③ Emitter

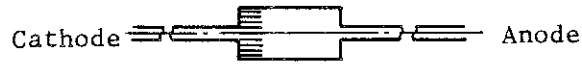
2. Rectifier diode bridge





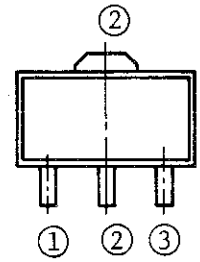
3. Shotky barrier diode

   11EQ03



4. Reset IC

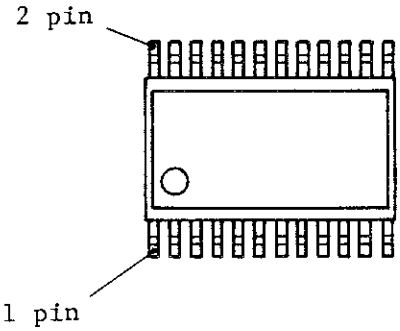
   M51943



Terminal
① Vcc
② GND
③ Reset out

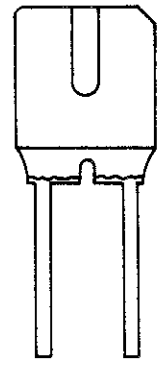
5. AF driver IC

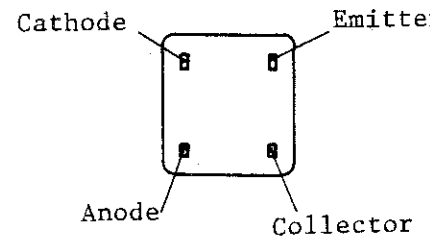
   M51049P



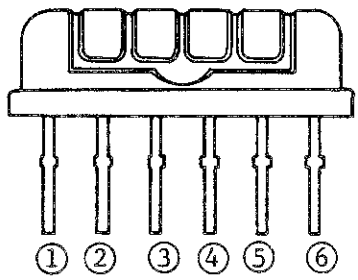
6. Photo interrupter

   GPIS07

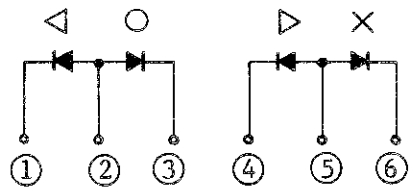




7. AF LED



Terminal arrangement



CIRCUITRY OUTLINE

1. Power control circuit

The same as in the F-301 except the following points

◦Decoder IC is changed. (M51045P➡M51046P)
(This is the same in Fig.1-1.)
◦'16sec. power hold timer' is changed to '8sec power hold timer'.
◦2) of 8sec. power hold operation is changed to ' To hold power while Auto exposure switch is on or Autofocus lock switch is on'.

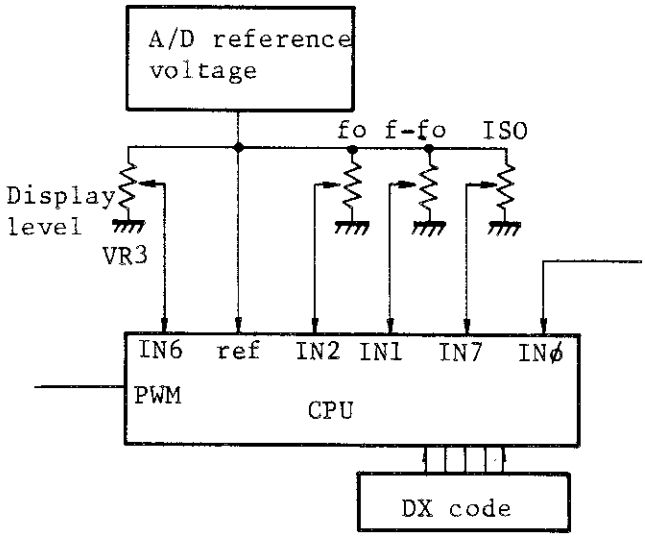
2. Metering calculation for LED display

The same as in the F-301 except the following points

◦CPU reads the ISO data from gray codes of ISO film speed dial or·····'
'CPU reads the ISO data from A/D conversion of brush's electric potencial of the variable resistor which actuates with ISO film speed dial and is located between Reference voltage for A/D conversion and GND or ·····'.

◦'The ends of both F-Fo resistor and Fo resistor are connected to Reference voltage for A/D conversion, and the other ends are connected to F-Fo reference voltage.' ——➡ 'The ends of both F-Fo resistor and Fo resistor are connected to Reference voltage for A/D conversion, and the other ends are connected to GND.'

◦Fig.2-1 is changed as follows;



3. Aperture control circuit

The same as in the F-301

4. Analog shutter speed control

The same as in the F-301

5. Digital shutter speed control

The same as in the F-301

6. Shutter actuating circuit

The same as in the F-301

7. LED display circuit

The same as in the F-301 except the following

'14 dots of LED for shutter speed display is directly controlled by Decoder IC.' ⟶ '14 dots of LED for shutter speed display and 4 dots of focus indicator LED are directly controlled by Decoder IC.'

8. Motor driving circuit(for film-advancing)

The same as in the F-301

9. TTL flash output control circuit

The same as in the F-301

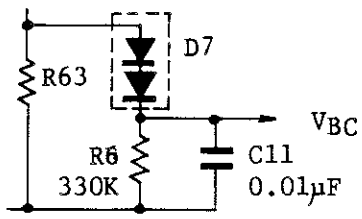
10. Aperture control on TTL programmed auto mode

The same as in the F-301

11. Battery check circuit

The same as in the F-301 except the following

In Fig.11-1, the position of C11 is changed to parallel position to R7.



12. Remote signal detecting circuit

The same as in the F-301

13. LED display circuit (other LEDs) and audio warning

The same as in the F-301

14. Variable resistors for adjustments

The same as in the F-301

15. Defocus amount detecting circuit (Fig.15-1)

Data are furniched between CPU and HIM via 6 lines, that are CLK, BUSC(Bus control) and 4-bits of NB0 - 3. CPU takes timing with BUSC and sends commands to HIM with NB0 - 3. The commands are to send data from CCD and A/D conversion.
On the other hand, after execution of the commands, HIM sends 8-bits data divided in two times (4-bits data in a time) to CPU with NB0 - 3, while taking timing with BUSC.

There is a circuit in HIM to control HSM. And it commands HSM to store the electric charge of CCD, transmit the data and reset with the five clocks of T, R and 1 - 3 used.
HIM outputs reference voltage(Vref) used for storage of electric charge in HSM and has a special A/D converter to A/D-convert the analog output from HSM.
In addition to that, HIM has 6 channels of A/D converters for general use. 2 channels of them send adjustment value for $\bar{x}p$ to compensate the data from CCD. HSM repeats the cycle of storage of electric charge, transmission and reset, and sends outputs from CCD to HIM.

CPU reads fo signal and transmits DS signal to HSM and HIM via decoder, by which it is decided which detector is used, F2.8 detector or F4.5 detector. After this process, HSM exchanges the components row and HIM exchanges the A/D timing of the output from CCD which is inputted serially. 24 pairs of the output data from CCD transmitted to CPU detect the distance from the film plane to the focusing point, with fixed algorithm for defocus amount calculation.

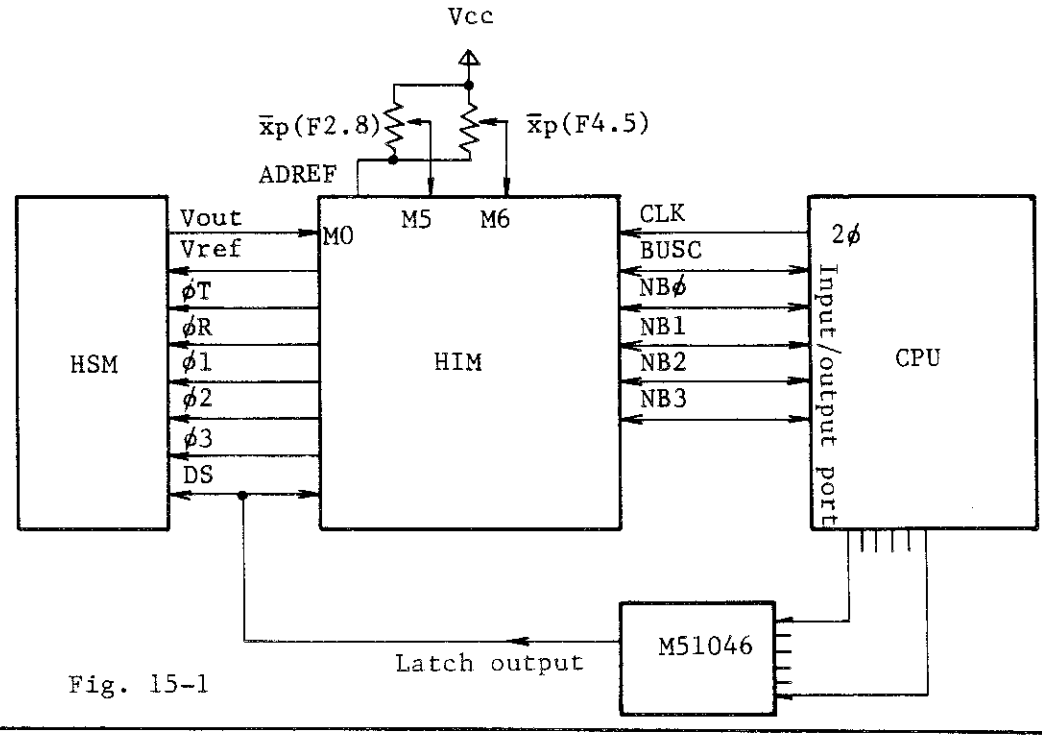


Fig. 15-1

16. Transmission of the AF lens data

When the power switch is turned on or fo signal is changed, CPU in the camera tries serial communication with the mount contacts. If the new AF lens (or TC-16AS) is attached, a proper response is returned to CPU. CPU judges whether the new AF lens is attached or not by checking the posiibility of the serial communication.
Signal lines for the communication are terminal B, C and D. Existence of CPU in the lens is detected by B signal from the camera. Then, digital command is transmitted serially by D signal and CPU reads it together with C signal. CPU in the lens treats this command and informs CPU with B signal that sending the data is ready.
Then, CPU in the camera outputs C signal to receive the data from lens. CPU in the lens transmits the appointed address data to CPU in the camera and informs CPU in the camera with B signal that sending the data is completed and receiving the next command is ready.

The above-mentioned operation is a cycle for data reading. CPU in the F-501 repeats this cycle and reads a series of data.
Serial communication after detection of new AF lens is carried out once a storage of CCD.

When the teleconverter TC-16AS is attached, the terminal for use is switched. i.e. When the teleconverter switch detects the teleconverter, CPU in the camera substitute E signal for B signal. (In CPU in the lens, the same terminal is used.)

In Fig.16-1, only lens distinction bits and bits for zoom encoder are indicated, but CPU in the lens has other bits, too.

17. AF lens driving control circuit (Fig.17-1)

The F-501 has circuits for driving of both of old type AF lens(AF Nikkor for the F3AF) and new type AF lens(AF AI Nikkor). After detecting of new or old type AF lens, CPU decides which circuit is used.

1) When the new type AF lens is attached

CPU makes the lens distinction signal(046- 32 or 049- 6) low and turns new lens Vcc on via M51046P. In order to drive the lens, CPU makes one of driving signals(A1 or A2) low. And CPU makes both of A1 and A2 low to brake the lens.
At that moment, if the focus mode selector is set to C or S, AF motor driving circuit(Q107 - Q110) is provided with base current.
The base current is approx. 40mA. And the current of the motor in driving the lens is approx. 600 - 800mA(in starting) or approx.200mA (in normal driving). If the focus mode selector is set to M, even though the driving signal(A1 and A2) reaches the motor driving circuit, current is not generated in the circuit and the motor does not rotate.

The photo interrupter which detects the motor rotation operates only when it is necessary. That is, only when the current actually flows in the motor driving circuit (when driving or braking), LED of the photo interrupter lights up. At the same time, the photo interrupter encodes light and shade of the signal plate which passes through the slit, and inputs the feedback pulse made rectangular by the comparator to the counter of CPU.

As for the actual sequence of the driving control, please refer to 'Autofocus system'.

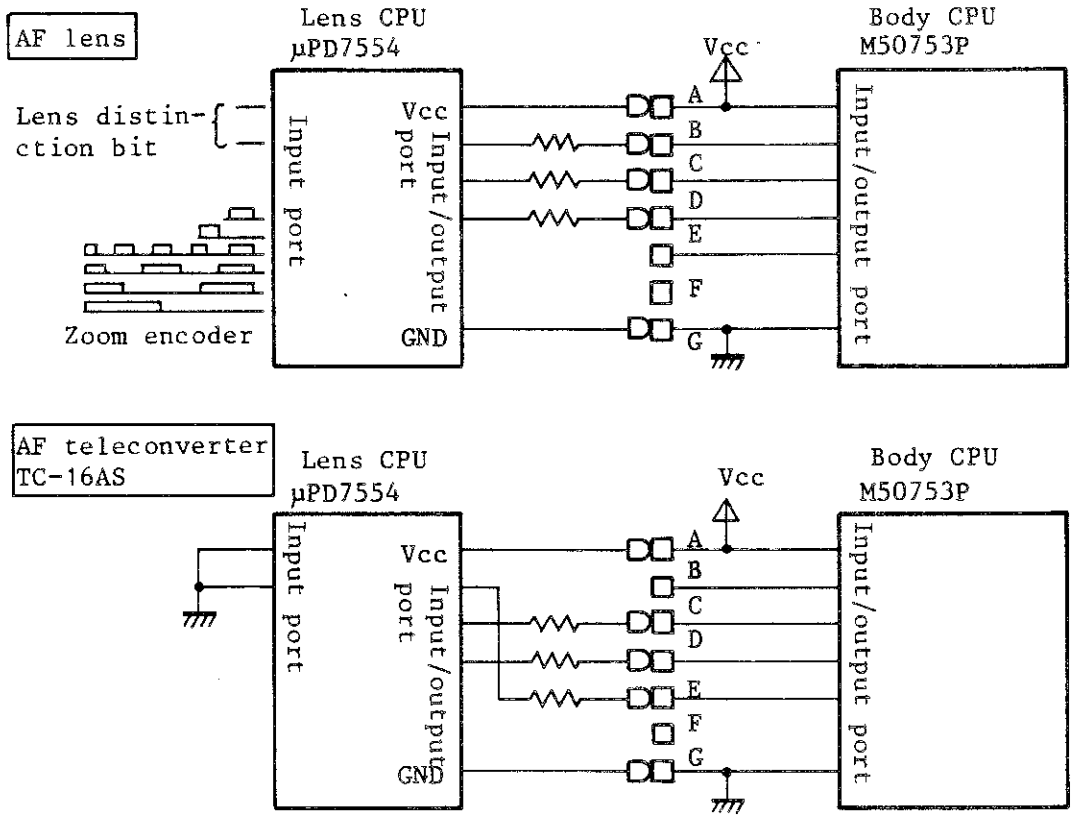

AF lens
Lens CPU
µPD7554
Body CPU
M50753P
Vcc
Lens distin-
ction bit
Input port
Vcc
Input/output port
GND
A
B
C
D
E
F
G
Input/output port
Zoom encoder
AF teleconverter
TC-16AS
Lens CPU
µPD7554
Body CPU
M50753P
Vcc
Input port
Vcc
Input/output port
GND
A
B
C
D
E
F
G
Input/output port

Fig.16-1

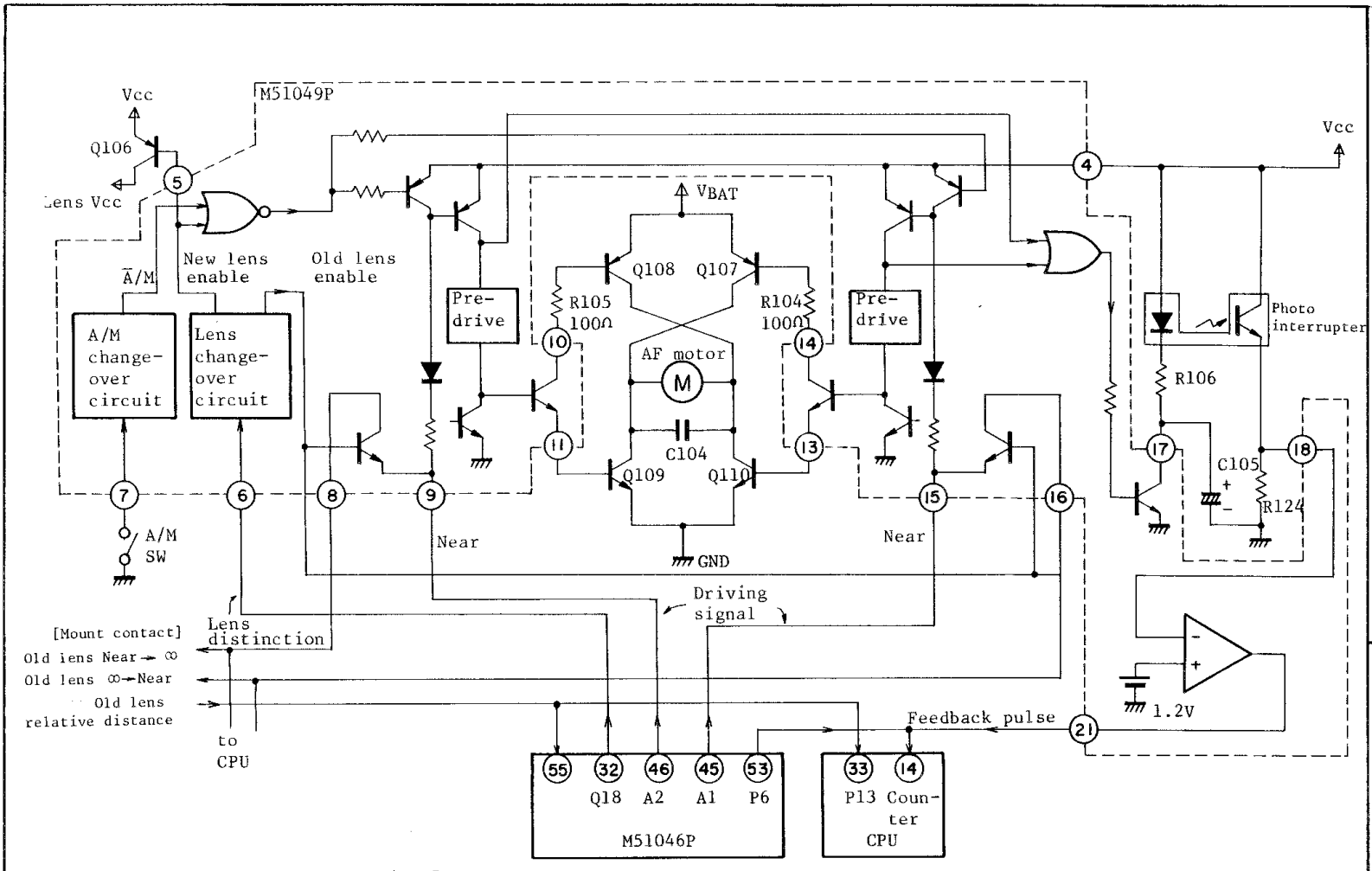

M51049P
Vcc
Q106
Lens Vcc
5
A/M
New lens enable
Old lens enable
A/M change-over circuit
Lens change-over circuit
7
6
8
9
A/M SW
Near
Pre-drive
R105 100Ω
10
11
VBAT
Q108
Q107
AF motor
M
C104
Q109
Q110
GND
R104 100Ω
14
13
Pre-drive
15
16
Near
4
Vcc
Photo interrupter
R106
17
18
C105
R124
Driving signal
[Mount contact]
Old lens Near → ∞
Old lens ∞ → Near
Old lens relative distance
Lens distinction
to CPU
1.2V
Feedback pulse
21
55
32
46
45
53
Q18
A2
A1
P6
M51046P
33
14
P13
Counter
CPU

Fig.17-1

2) When the old type AF lens is attached

The relative distance signal terminal of the old type AF lens is for transmission of the feedback pulse to detect the rotating amount of the motor in the lens. Between this terminal and GND, resistors of approx. 200 - 3.3kΩ are connected. The port(P13) of CPU reads the information from this terminal. If the result is low, it is judged that the old type AF lens is attached.

When the old type AF lens is distinguished, the lens distinction signal (046- ㉜ or 049- ⑥) becomes high and the new lens Vcc is turned off. At the same time, the power source of 3V for the old type AF lens is turned on via 046.
If the lens distinction signal is high, the driving signal(A1, A2) output from 046 is directly transmitted to 049 8 and ⑥ pin and then, transmitted to the lens via two terminals of the mount contacts. Then, the motor in the lens will rotate.

The focus mode is not decided by the focus mode selector of the camera but is decided by the focus mode selector of the lens.
The feedback pulse enters to 046 and is changed to rectangular pulse and then, enters to the counter of CPU.

As for the actual sequence of the driving control, please refer to 'Autofocus system'.

3) When the non-AF lens is attached

When the result of the lens distinction does not apply to either of the above-mentioned two cases, a non-AF lens is distinguished. In this case, the lens distinction signal is high(old type AF lens side), Vcc for the new AF lens is turned off and also the power source for the old type AF lens is turned off.

◦Vcc supply circuit for new and old type AF lenses (Fig.17-2)

When the power source is turned on or fo signal is changed, the lens distinction signal L is output via 046 to try the serial communication against the lens. And Vcc for new type AF lens (5 - 6V) is turned on once. Then, the serial communication is tried twice successively.
The following operation will be divided as shown below according to the result.

1 In case that the serial communication is acceptable (in case that new type AF lens is attached):
The power source for the new AF lens remains on and 3V power source is not turned on.

2 Incase that the serial communication is not acceptable
2 -1. When the relative distance terminal for old type AF lens (P13 of CPU) is low (when the old type AF lens is attached):
The lens distinction signal becomes high, the power source for the new type AF lens is turned off, 3.6V output is turned on via 046 and the power source for the old type AF lens is turned on.
2 -2. When the relative distance terminal for old type AF lens (P13 of CPU) is high (when the non-AF lens is attached):
The lens distinction signal becomes high, Vcc for the new AF lens is turned off, 3.6V output remains off and the power source for the old type AF lens is turned off.

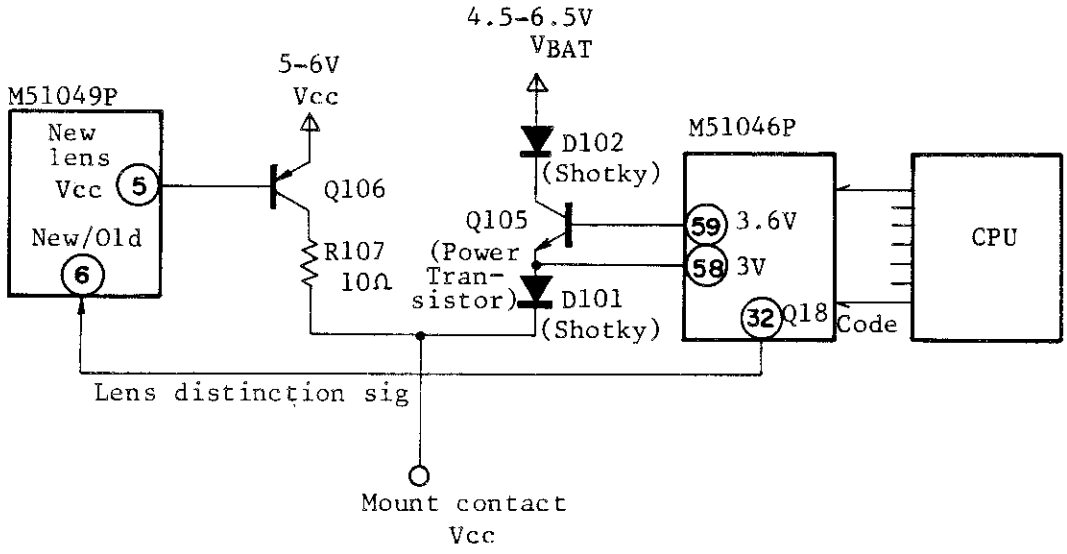

4.5-6.5V
V_{BAT}
5-6V
Vcc
M51049P
New
lens
Vcc
5
New/Old
6
Q106
R107
10Ω
D102
(Shotky)
Q105
(Power
Tran-
sistor)
D101
(Shotky)
M51046P
59
3.6V
58
3V
32
Q18
Code
CPU
Lens distinction sig
Mount contact
Vcc

Fig.17-2

INSPECTION STAMDARDS FOR REPAIR & TOOLS

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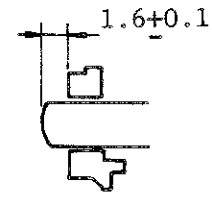
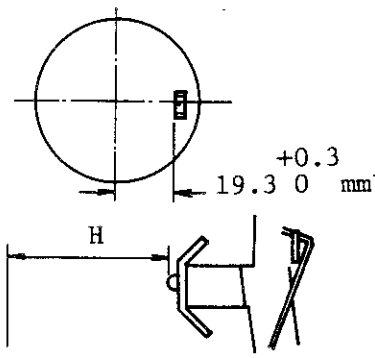
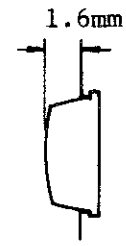
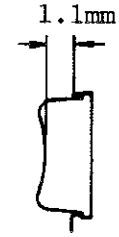
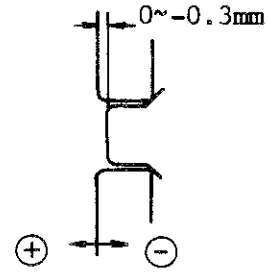
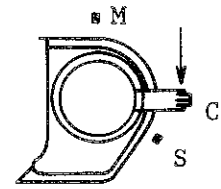
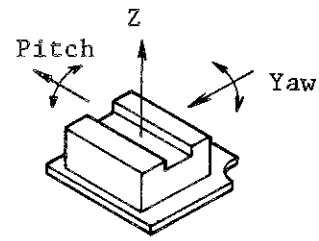
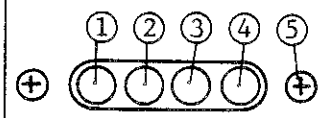
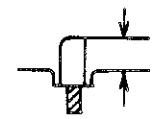
INSPECTION STANDARDS FOR REPAIR

*Please refer to 'INSPECTION STANDARDS FOR REPAIR' of the F-301 repair manual, for further information on the standard regulations.

	ITEM	STANDARD	TOOL
VIEWFINDER	Focus brackets	Against the viewfinder frame inclination: within 1° displacement from the center: X=0±0.2mm Y=0.5±0.2mm	
LENS MOUNT	Lens release button	Tension: 700g or less (on S or C mode of AF mode)	J5029
	AF coupling	Operation: When the lens release button is pressed to the end, its head should be below the bayonet face(on S or C mode). The coupling should be below the bayonet face(on M mode). Height: 1.6±0.1mm Tension: 60g or less(on the bayonet face) 	Slide caliper J5018
	Aperture lever	Height: $3.1^{+0.1}_{-0}$mm (after shutter-cocking) Stroke: 7.1mm or more Tension for return: 90 - 120g Horizontal position: $18.7^{+0.35}_{-0.3}$mm (from the center of the camera) Depth: $5.8^{+0.9}_{-0.5}$mm(from the bayonet face)	Slide caliper J5019 J18004 J18005-1
	Screen installation	Spring release tension: 90±30g	J5018

	ITEM	STANDARD	TOOL
	fmm lever	Horizontal position: $19.3^{+0.3}_{-0}$ mm Stroke: Tension: 	Slide Caliper J5019
		Focal length / H / Tension / PDUAL Shorter than 135mm / 6.9mm or shorter / 40gr or more / PN 135mm or longer / 7.25 - 8.0mm / / PHI Telecon-verter / 8.2 - 8.4mm / 60gr or less / PHI	
AE LOCK BUTTON/AF LOCK BUTTON/SELF-TIMER BUTTON	AE lock button	ON position: To be on at limit OFF position: To be off when the finger is lifted from the button Tension: 110 - 190g Height: 1.6mm or more 	J5019 Slide Caliper
	AF lock button	ON position: To be on at limit OFF position: To be off when the finger is lifted from the button Tension: 110 - 190g Height: 1.1mm or more 	J5019 Slide Caliper
	Self-timer button	Reset: To be reset by pressing self-timer button during self-timer is in operation Height: 0 - -0.3mm ON position: -0.8mm - -1.4mm Tension: 60g or more Delay action time: 10±2sec 	J5019 Slide Caliper Watch

	ITEM	STANDARD	TOOL
FOCUS MODE SELECTOR	Focus mode selector	M mode: Servo does not operate. C mode: Shutter can be released whether the lens is focusing or not. S mode: Shutter cannot be released until the lens focuses. Switching torque: 350±100g 	J5029 New AF lens
HSM	Accuracy	Yaw: 0±3mrad Pitch: 0±6mrad Z: 0±30μm 	J18185 J18184 J15259 J18183 J18186 J15253-1 J15253
DATA BACK CONTACT	Data back contact	  Diecast is regarded as reference. 1 Focusing signal contact 2 Imprint signal contact 3 Power hold/release signal contact 4 GND 5 Body distinction screw Height of 5 : $1.4^{+0.3}_{-0.2}$mm	
AF ACCURACY	Low brightness limit Lighting range of in-focus indicator LED	F2.8 detector: EV4 or brighter F4.5 detector: EV5 or brighter ±150μm (conversion at image surface)	50mm F1.8 AF lens
STROBE	Warning for minimum aperture setting	With an AI-S type lens AV8(F16) < Warning does not operate. AV6(F8) ≧ Warning operates.	SB-15